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1682. MEENAN (F. O. C.). **The incidence of interdigital fungous infections in University Students.**—*J. Irish med. Ass.*, 33, 196, pp. 102–104, 1953.

Examination between October, 1952, and May, 1953, at St. Vincent's and The Children's Hospitals, Dublin, of 100 male university students aged 20 to 30 years, mostly Irish, showed that 93 presented clinical signs compatible with a diagnosis of tinea pedis, though in 24 the signs of scaling or maceration were minimal. Ten showed marked signs of infection and the remaining 59 symptoms of varying severity. Microscopic examination of the scrapings gave positive results in two cases, one from the group of 10 classified as 'severe' on clinical grounds, in which the amount of fungus present was scanty; in the other, from the group of 59, infection was mild though fungus growth was plentiful. *Trichophyton interdigitale* was isolated in two cases, one microscopically negative and the other the mild case with profuse fungal growth; only limited growth was obtained from the former.

The 'mosaic' fungus [1, Nos. 351, 353; 2, No. 1644] was found in three cases out of every four, but was not considered to be evidence of infection. It was also present in two clinically normal cases.

It is apparent that the diagnosis of tinea pedis is far from satisfactory. The question arises whether it is a grossly over-diagnosed condition or whether the laboratory techniques in general use are faulty. If the view that fungus is always present is correct, then the clinical signs are out of all proportion to the amount of fungus present. Another hypothesis is that the presence of a pathogenic fungus is purely coincidental.

1683. SLOPER (J. C.). **A study of experimental human infections due to Trichophyton rubrum, Trichophyton mentagrophytes, and Epidermophyton floccosum, with particular reference to the self-limitation of the resultant lesions.**—*J. invest. Derm.*, 25, 1, pp. 21–28, 3 figs., 1955.

This is a report from the Bernhard Baron Institute of Pathology, London Hospital, England, on work carried out in Malaya on experimental tinea corporis during a natural epidemic [2, No. 606]. Various parts of the body were successfully inoculated with pure cultures and with scales from lesions artificially produced by *Trichophyton mentagrophytes*, *T. rubrum*, and *Epidermophyton floccosum*. The lesions were covered with elastoplast or nylon dressings but no therapy was applied, and all healed spontaneously after 30 to 85 days, with no recurrence in any case up to five years later. This spontaneous healing of the lesions of all three species, one of which (*T. mentagrophytes*) is zoophilic and the other two anthropophilic, weakens the generally accepted distinction between the behaviour of fungi of these types.

1684. MANTEN (A.). **Over de bestrijding van het zwemmerseczeem.** [On the control of swimmer's eczema.]—*Pharm. Weekbl.*, 90, 1, pp. 1–9, 1955. [English summary.]

The *in vitro* action of 36 substances on *Trichophyton interdigitale* was tested

at the Institute of Public Health, Amsterdam, the phenol coefficients being estimated after 10-minute and six-hour exposures. The minimal fungistatic concentration and the inactivation of the chemicals by 10 per cent. blood serum were also determined. Among the most promising for potential clinical application were certain phenol derivatives, e.g., hexachlorophenol and hexylresorcinol, gentian violet, brilliant green, and trypaflavine, merthiolate, phenyl mercury nitrate, and some quaternary ammonium compounds, such as cetyltrimethylammonium bromide.

1685. Ortenzio (L. F.). **Report on fungicide and germicidal rinse testing methods.** —*J. Ass. off. agric. Chem., Wash.*, 37, 3, pp. 616–620, 1954.

The following amendments to the standard method for the assay of fungicides are recommended as a result of experiments conducted in response to complaints that conidia of *Trichophyton interdigitale* [see next entry] could not be produced within the specified resistance range: that neopeptone agar at pH 6·1 to 6·3 be used as a substrate and stock spore suspensions prepared with a heat-sterilized glass tissue-grinder; that conidia stored in saline at 2° to 10° C. for up to four weeks be accepted; that subcultures be made on neopeptone broth also at pH 6·1 to 6·3; and that five mycelial mats be macerated in 20 to 25 ml. saline.

1686. Ortenzio (L. F.). **Report on fungicide and germicidal rinse testing methods.** —*J. Ass. off. agric. Chem., Wash.*, 38, 2, pp. 274–280, 1955.

Further studies on the resistance to phenol of *Trichophyton interdigitale* spores [see preceding entry] revealed satisfactory agreement between the end point in the first-action method of testing and the effective dilution for the disinfection of non-porous surfaces when spores of the specified resistance are used. No change is recommended, therefore, in the resistance requirement laid down in the present method. On the other hand, the subtransfer procedure for the elimination of erroneous results, due to the fungistatic action of small amounts of the test fungicides carried over to the dextrose-neopeptone subculture broth on the transfer needle, was shown to be inadequate in the case of certain chemicals, e.g., quaternary ammonium compounds and mercurials. Consequently, the introduction of an amendment is advised, providing for the incorporation in subculture media of recognized neutralizers or reversing substances, such as letheen or tamol N.

1687. Molinas (S.). **In vivo screening of anti-fungal ointments.**—*J. invest. Derm.*, 25, 1, pp. 33–42, 1955.

A method for the *in vivo* screening of anti-fungal ointments on guinea-pigs has been evolved at the Food and Drug Administration, United States Department of Health, Education and Welfare. Four different ointments were tested on separate areas of each animal, treatment being begun immediately after the spore suspension of *Trichophyton mentagrophytes* had been rubbed into the areas. A zinc undecylenate ointment was used as control. Of the ointments tested only four, those containing salicylic acid, benzoic acid, benzathiazole ether, sodium propionate propionic acid, or undecylenic acid, were able to prevent the appearance of a typical lesion after 12 to 14 days. There was no correlation between *in vitro* and *in vivo* tests, ointments containing 2,2′ dihydroxy-5-5′ dichlorodiphenylmethane, salicylanilide, benzethonium chloride (diisobutylphenoxyethoxy-ethyldimethylbenzylammonium chloride), or salicilanilide+benzethonium chloride, proving highly fungicidal *in vitro* but useless *in vivo*.

1688. English (Mary P.) & Barnard (N. H.). **The effect of trace metal deficiency on some Trichophyton strains.**—*Trans. Brit. mycol. Soc.*, 38, 1, pp. 78–82, 1 pl., 1955.

At British Drug Houses Ltd., London, an attempt was made to elucidate the trace-metal requirements of two strains each of *Trichophyton mentagrophytes* and *T. rubrum* [1, No. 580]. Adsorption of the metals with calcium carbonate proved to be the most efficient way of removing them from a medium containing a complex nitrogen source. No difference between the species in iron, zinc, manganese, and copper requirements was indicated by the effect of deficiency in them on the weight of the mycelial mat, but three strains were highly sensitive to iron and zinc deficiency and one strain of *T. rubrum* to manganese deficiency also. The red pigment of this strain turned bright yellow in a manganese-deficient medium. There were no marked changes in morphology.

1689. Raubitschek (F.). **Nutritional requirements of dermatophytes in continuous shake culture.**—*J. invest. Derm.*, 25, 2, pp. 83–87, 1955.

Experiments were carried out at the Hebrew University-Hadassah Medical School, Jerusalem, Israel, on the nutrition of three isolates of *Trichophyton mentagrophytes*, two of *T. rubrum*, two of *T. tonsurans*, and one of *Epidermophyton floccosum* grown in continuously shaken cultures. The type of growth produced under these conditions resembles that of the parasitic phase of the fungi and is therefore referred to as the 'pseudo-parasitic' phase. All the fungi except *E. floccosum* are able to proliferate slightly in a basal salts medium containing only ammonium sulphate, presumably indicating that they obtain their carbon from the atmosphere. Growth is greatly increased when a carbohydrate source is added, while yeast extract exerted a similar effect on all the species except *T. tonsurans*. Both casein hydrolysate and peptone, added singly to the basal substrate, were as effective as the ammonium sulphate-carbohydrate-yeast extract medium.

1690. Coudert (J.). **Teigne du cuir chevelu de l'enfant de type mégaspore due à Trichophyton album.** [Large-spored tinea of the scalp in a Child, caused by *Trichophyton album.*]—*Ann. Parasit. hum. comp.*, 30, 1–2, pp. 144–149, 3 figs., 1955.

From the Faculty of Medicine and Pharmacy, Lyons, a case of tinea capitis is described in a 12-year-old boy living on a farm at Chablais. The lesion had been present for four years and was first noticed after a mule belonging to the farmer had developed bald, crested patches. The boy's sister, then 12 years old, also developed a lesion, which cleared spontaneously, however, in a few months. The coalescent lesions, with inflamed, vesiculated edges, involved almost the entire upper part of the boy's scalp. They were covered by a thin, yellow, cracked, scaly crust, and the hairs were lustreless and easily removed. Under Wood's light these hairs showed a very pale green fluorescence quite distinct from that of the *Microsporum* tineas or favus [*Trichophyton schoenleini*]. The patient was successfully treated by X-ray epilation. On microscopic examination, fungal hyphae and air bubbles were found inside the hairs, the former giving rise to short chains of large, polygonal spores on the outer surface. In culture typical colonies of *T. album* [*T. verrucosum*] were obtained.

1691. Gumpesberger (G.) & Tirschek (H.). **Zur Klinik follikulärer und nodöser Epidermophytien an den Unterschenkeln.** [On the clinical aspect of follicular and nodal epidermophytoses on the lower legs.]—*Z. Haut- u. Geschlechtskr.*, 18, 10, pp. 295–298, 1 fig., 1954.

Of the ten cases of epidermophytosis of the lower legs herein reported from

the University Clinic for Skin Diseases, Vienna, eight were caused by *Epidermophyton* Kaufmann-Wolf [*Trichophyton interdigitale*], one by *E. inguinale* [*E. floccosum*], and one by *E.* [*T.*] *rubrum*.

1692. Hoops (E.-H.). **Klinische Beobachtungen einer modernen Chemotherapie mykotischer Hauterkrankungen.** [Clinical observations on a modern chemotherapy of mycotic skin diseases.]—*Med. Welt.*, N.S., *1954*, 33–34, pp. 1109–1110, 1954.

On the basis of results obtained at the Skin Clinic of the Düsseldorf Medical Academy the author considers bradex and bradex-vioform ointments [2, No. 885] to be among the most effective of the newer remedies for [unspecified] mycotic eczema of the interdigital spaces and for the scattered foci of infection known as 'mycids'.

1693. Silva (Margarita), Kesten (Beatrice M.), & Benham (Rhoda W.). **Trichophyton rubrum infections : a clinical, mycologic and experimental study.** —*J. invest. Derm.*, 25, 5, pp. 311–326, 6 figs., 1955.

Studies at the Department of Dermatology, Columbia-Presbyterian Medical Center, New York City, of 43 cultures of *Trichophyton rubrum* isolated from 70 patients showed that differences in the morphology, pigment production, nitrogen requirements or virulence to guinea-pigs could not be correlated with the type of lesion. Culturing the fungus in autoclaved soil was found to be of value in preventing and reverting pleomorphic changes. Experimental inoculation of guinea-pigs and rabbits produced lesions lasting from one to four weeks, while that of two patients succeeded in reproducing typical lesions, showing that resistance to the parasite is not acquired. It is considered that human infections are confined to the hands and feet unless the patient is in poor health or the skin has been damaged. It was noted that pigment production in cultures increased when the cultures were subjected to fluctuating temperatures. Sterile filtrates from cultures of *Staphylococcus aureus* and *S. albus*, which prevented the growth of *T. rubrum* on isolation plates, had beneficial effects when applied to the infected nails of two patients.

1694. Chakraborty (A. N.), Ghosh (S.), & Blank (F.). **Isolation of Trichophyton rubrum (Castellani) Sabouraud, 1911, from animals.**—*Canad. J. comp. Med.*, 18, 12, 436–438, 1 fig., 1954.

Trichophyton rubrum was isolated from lesions on various parts of the body of one dog and two cows at the Bengal Veterinary College, Calcutta, this being apparently the first record of its occurrence in animals. The cultures presented slight radial folds near the margin round the hemispherical centre. Later they became overgrown by a long, fluffy, white, aerial mycelium. On Sabouraud's glucose agar a purple pigment formed which also developed in the marginal hyphae. Pyriform microconidia, mostly borne singly on the hyphae, and allantoid, thin-walled macroconidia were observed. In older cultures chlamydospores were present.

1695. MacKenna (R. M. B.) & Calnan (C. D.). **Trichophyton rubrum infection.**—*Brit. J. Derm.*, 66, 11, pp. 411–412, 1954.

A brief description is given of an infection of an 18-year-old girl [? at St. John's Hospital, London], with scaling of the soles and toe-webs, the palmar surface and fingers of the right hand, discoloration of the toe- and finger-nails, and a large, irregular patch of erythema on the left leg. *Trichophyton rubrum* was isolated from all the sites, and lanugo hairs from the leg were shown to contain a large-spored endothrix fungus.

1696. Hansell (J.) & Partridge (B. M.). **Favus ; a report of seven related cases.** —*Brit. med. J.*, *1955*, pp. 1510–1511, 2 figs., 1955.

A child aged 14 months was found at the Central Middlesex Hospital, London, to be suffering from favus. Examination by Wood's light of the contacts at the day nursery she was attending brought to light a second case. The first case had stayed for three months with an aunt in Kent. This lady and four of her daughters had scalp infections typical of *Trichophyton schoenleini*. She had a history of 'scalp trouble' since she was five. *T. schoenleini* was cultivated from five of these seven cases. All were successfully treated by epilation, X-rays being used in six cases.

1697. Lévy-Lebhar (G.). **Le traitement des teignes marocaines.** [The treatment of Moroccan tineas.]—*Maroc méd.*, 34, 360, pp. 580–589, 3 figs., 1 diag., 2 graphs, 1955.

Full details are given of the organization and execution of a mass campaign for the therapy of trichophytoses (*Trichophyton* spp.) and favus [*T. schoenleini*] among schoolchildren in Morocco from 1951 to 1954, inclusive.

1698. Jung (H.-D.). **Zur Diagnose und Therapie des Favus.** [On the diagnosis and therapy of favus.]—*Hautarzt*, 9, 1, pp. 12–17, 9 figs., 1955.

On the basis of observations on 12 cases of favus (*Trichophyton schoenleini*) encountered at the Skin Clinic of Greifswald University, Germany, during the past five years, the author differentiates and describes seven forms of the complaint, namely, incipiens, scutularis, urceolaris, squarrosus, pityroides, impetiginoides, and cicatrisans. Five of the patients were residents of Mecklenburg, while the others originated in Silesia, Bessarabia, and East Prussia. Therapy by means of X-ray epilation combined with ovitrol (also known as D25 [2, Nos. 1371, 1804) and novex [2, Nos. 897, 1371, 1647] proved effective.

1699. Sharvill (D.). **Trichophyton sulphureum ringworm infections in an adult scalp, a newborn Infant, and three Nurses.**—*Brit. med. J.*, *1955*, pp. 415–417, 1955.

In a hospital of the South East Kent Group, a baby aged 14 days developed an infection of the face due to *Trichophyton sulphureum*. The mother had a mild infection of the scalp due to the same organism. Three nurses who fed the baby developed typical rashes on their arms at the place on which the baby's face rested during feeding. They cleared rapidly with fungicides. From the times at which the infant and the nurses developed their lesions, the incubation period of the disease appears to range from 13 to 15 days.

1700. Taschdjian (Claire L.) & Muskatblit (E.). **Hyphal fusion between Trichophyton tonsurans variants as an indication of species relationship.**—*Mycologia*, 47, 3, pp. 339–343, 1 fig., 1955.

In studies at the New York University Post-Graduate Medical School and the Skin and Cancer Unit, New York University Hospital, fusions occurred when each of two strains of *Trichophyton tonsurans* var. *sulphureum* [*T. sulphureum*] were paired with each of 14 strains of *T. t.* var. *crateriforme* [*T. tonsurans*] and with each of two strains of *T. t.* var. *sabouraudii* [*T. sabouraudi*]. The two strains of *T. sabouraudi* fused with each of eight strains of *T. tonsurans*. Fusion occurred between a normal and a pleomorphic strain of *T. sulphureum* and between the pleomorphic and the normal strains of *T. tonsurans*.

In the fusions observed a short side branch produced from one hypha fused with a parallel hypha from the other strain, which put out a knob-like

projection at the junction, the result being the formation of an H-shape. Hyphae crossing at angles anastomosed with short lateral branches, forming a letter A. Occasionally a lateral branch fused with a somewhat remote hypha.

1701. Sullivan (M.) & Wood (J. L.). **Trichophyton tonsurans infection of the scalp.**—*Arch. Derm. Syph., Chicago*, 71, 3, pp. 398–399, 3 figs., 1955.

An eight-year-old white girl was seen at the Johns Hopkins Hospital, Baltimore, complaining of alopecia and a pustular eruption of the scalp. *T. tonsurans* was isolated, the first record for Maryland. Treatment with colloidal mercury bioleate and sulfisoxazole resulted in complete cure.

1702. Ehrmann (G.) & Granits (J.). **Zur Pathogenität der Scopulariopsis brevicaulis, ein seltener Fall von Kladiose.** [On the pathogenicity of *Scopulariopsis brevicaulis*, a rare case of cladiosis.]—*Z. Haut- u. Geschlechtskr.*, 19, 5, pp. 129–132, 3 figs., 1955.

From the University Clinic for Skin Diseases, Vienna, the authors describe a case of ulceration of the ankles caused by *Scopulariopsis brevicaulis* [2, No. 1112] in a 64-year-old peasant woman. In none of the other 19 cases of deep-seated dermatomycosis investigated during the past three years could the same fungus be demonstrated. On the basis of cultural and morphological studies it is concluded that the fungus should be referred to *Mastigosporium* [*blochii*] (Hypocreales), as originally proposed by Matruchot (*C.R. Acad. Sci., Paris*, [152, pp. 325–327], 1911).

1703. Cairns (R. I.) & Close (H. G.). **Onychomycosis caused by Scopulariopsis brevicaulis.**—*Brit. J. Derm.*, 67, 7, pp. 264–265, 1955.

Case reports are given of onychomycosis in the great toe nails of three housewives, from all of which *Scopulariopsis brevicaulis* was isolated. Two of the infections followed previous injury. In one case sections showed that the fungal hyphae actually penetrated the nail substance [2, No. 841].

1704. Windisch (S.). **Zur Biologie und Systematik häufiger Trichosporon-Arten.** [Contribution to the biology and systematics of common *Trichosporon* species.] —*Zbl. Bakt.*, Abt. 2, 108, 23–25, pp. 688–702, 1955.

Of 37 strains of *Trichosporon* examined at the Institute for Fermentation Industries, Berlin, including a number of human and animal origin, 24 were assigned to *T. cutaneum* [1, No. 837 and next entry] and eight to *T. infestans*, the latter species having been separated from the former by Lodder and Kreger-Van Rij (The Yeasts. North Holland Publishing Co., Amsterdam, 1952), but both groups comprised transitional forms which could only be identified provisionally. The vitamin requirements of the two species are relatively well defined, aneurin [vitamin B_1] and in some cases biotin being essential to *T. cutaneum*, whereas *T. infestans* mostly needs both, sometimes only vitamin B 1.

None of the strains exhibited clear-cut budding or mycelial growth but developed by an intermediate process, typical of which is the formation of transverse septa in the cells either immediately or some time after their production. The morphogenetic character of septation is considered to differentiate *Trichosporon* from all other yeast genera, especially *Endomycopsis*.

1705. Reiersöl (Signy). **Trichosporon cutaneum isolated from a case of otomycosis.** —*Acta path. microbiol. scand.*, 37, 5, pp. 459–463, 4 figs., 1955.

At the State Institute for Public Health, Oslo, Norway, *Trichosporon cutaneum* [see preceding entry] was isolated on wort and Sabouraud's glucose

agars from the ear canals of a 20-year-old woman with typical symptoms of otomycosis, i.e., intensive irritation, a sense of fullness, and impaired hearing. Discussing the literature on the very confused taxonomy of the fungus, the author inclines to the opinion that *T. beigelii* [2, No. 912] and other species concerned in the etiology of white 'piedra' are synonyms of *T. cutaneum*.

1706. Zapater (R. C.) & Malfatti (M.). **Aspect morphologique de quelques champignons pathogènes au microscope electronique.** [The morphological aspect of some pathogenic fungi under the electron microscope.]—*Rapp. Commun. VIII^e Congr. int. Bot., 1954*, Sect. 18–20, p. 127, 1954.

With the aid of the electron microscope the authors made a morphological study of *Candida albicans*, *C. tropicalis*, *C. krusei*, *C. parakrusei*, *Histoplasma capsulatum*, *Paracoccidioides brasiliensis*, *Nocardia asteroides*, *N. brasiliensis*, and *N. madurae* in their yeast and mycelial phases. Cytoplasmic concentrations were observed, the interpretation of which demands further cytochemical researches [2, No. 1909].

1707. Esteves (J.) & Antunes (Maria M.). **Acladiosis. Report on a case.**—*Docum. Med. geogr. trop.*, 7, 2, pp. 140–145, 7 figs., 1955. [Portuguese summary.]

From the Institute of Pathological Anatomy and Tropical Medicine, Lisbon, the authors report a case of chronic ulcerative dermatosis covering the face, neck, and thorax of a 46-year-old male for a period of two years. The first symptoms appeared six months after the patient's return from Portuguese Guinea, where he had spent ten months. Histological examination revealed tuberculoid granulomata, cultures from which on 2 per cent. glucose agar and Sabouraud's glucose medium yielded *Aleurisma castellanii*, a fungus of extreme rarity.

1708. Kominami (K.) & Soneda (M.). **Studies on the genus Pityrosporum in Japan.**—*Mycol. J. Nagao Inst.*, 4, pp. 26–29, 4 figs., 1954.

Two strains of *Pityrosporum ovale* [1, Nos. 1770, 2216] isolated from human skin were unable to grow on malt agar unless olive oil was added to the medium. A third yeast, *P. pachydermatis*, isolated from elephant skin, grew slightly on malt agar and was able to utilize potassium nitrate but not olive oil. Neither species exhibited any fermentative ability.

1709. Jelliffe (D. B.) & Jacobson (F. W.). **The clinical picture of tinea versicolor in Negro Infants.**—*J. trop. Med. (Hyg.)*, 57, 12, pp. 290–292, 3 figs., 1954. [Received 1955.]

The authors describe the specific clinical syndrome produced by skin infected with tinea versicolor (*Malassezia furfur*) in infants of African ancestry [2, No. 1091] in Nigeria and Jamaica. The condition appears to occur most frequently in plump, well-nourished, and otherwise healthy, breast-fed infants, the earliest cases seen so far showing white, depigmented, slightly scaly, non-infiltrated, circumscribed skin lesions in the perineum, groins, or gluteal regions, or on the face, or in both areas. In more advanced cases the lesions may coalesce to involve almost all of the perineum, groins, and buttocks. In addition to this and to similar lesions on the face, a highly characteristic feature is the presence of blotchy, somewhat rounded islands of achromatic, slightly scaly skin, ranging from a few mm. to several cm. in diameter, extending as a scattered archipelago to the abdominal wall anteriorly and the lower back posteriorly.

Although disfiguring, the complaint is not important in itself. The main

clinical significance lies in its differentiation from similar conditions, its principal features being the rapidity of spread, distribution, and completeness of the depigmentation. The diagnosis may be confirmed by finding hyphae of *M. furfur* in the lesions and the fluorescence of the latter under Wood's light.

1710. Bourgain & Paucher. **Piedra noire chez un Ouvrier de l'arsenal de Lorient.** [Black piedra in a Worker at the arsenal de Lorient.]—*Rev. Méd. nav.*, 10, 1, pp. 39–40, 1955.

The authors report a case of black piedra (*Piedraia hortai*) [1, Nos. 18, 1976, 2220] in a 32-year-old worker at the maritime arsenal de Lorient, France, infection having been contracted three years earlier in Cochin-China.

1711. Guilhon (J.) & Obry (J.). **Sporotrichose du Chien.** [Sporotrichosis of the Dog.]—*Rapp. Commun. VIII^e Congr. int. Bot., 1954*, Sect. 18–20, p. 125, 1954.

Sporotrichosis of the dog (*Rhinocladium* [*Sporotrichum*] *schencki*), affecting young male animals chiefly, may terminate fatally or heal up with or without treatment. The causal organism is present as conidial yeasts in the macrophages or in the free state in the pus from the gummy lesions.

1712. Hawks (G. H.). **Sporotrichosis. Report of three cases from Toronto.**—*Canad. med. Ass. J.*, 72, 1, pp. 28–32, 4 figs., 1955.

The available information on sporotrichosis (*Sporotrichum schencki*) is briefly presented, with special reference to its occurrence in Canada [1, No. 2212], and three further cases are reported from Toronto, all involving the fingers and arms and yielding to the oral administration of potassium iodide.

1713. Ales Reinlein (J. M.) & Ortiz Masllorens (F.). **Esporotricosis.** [Sporotrichosis.]—*Rev. clín. esp.*, 56, 3, pp. 153–159, 8 figs., 1955.

This is a review of 26 contributions to the literature on the history, etiology, epidemiology, clinical manifestations, pathological anatomy, diagnosis, prognosis, and treatment of sporotrichosis (*Sporotrichum schencki*). The countries from which the disease has been reported are the United States, Mexico, South Africa, and France.

1714. Mülhens (H. J.). **El 'Sporotrichon beurmanni' y las especies de 'Candida' patogénas para el Hombre, influidos por la quimoterapía moderna.** [*Sporotrichum beurmanni* and the species of *Candida* pathogenic to Man influenced by modern chemotherapy.]—*Med. colón.*, 23, 3, pp. 212–222, 1954.

In *in vitro* experiments at the Medical-Diagnostic Institute, Hamburg, badional sulphathiocarbamide (phoutamide) and surfen (a non-staining quinoline compound) [2, No. 1584] inhibited the growth of *Sporotrichum beurmanni* [*S. schencki*] on 1 per cent. Grütz's liquid medium at dilutions up to 0·015 and 0·003 per cent., respectively. Badional also exerted a markedly beneficial effect on the course of experimental sporotrichosis in white mice. In further *in vitro* tests the same compound was fungistatic to *Trichophyton asteroides* [*T. mentagrophytes*] and *T. rubrum* at 0·015, and to *Actinomyces bovis* and *Microsporum gypseum* at 0·06 per cent. The growth of *Candida albicans* was inhibited by surfen at 0·03, thiosemicarbacide at 0·06, thiosemicarbazone of enanaldehyde at 0·125, dibromosalicyl at 0·25, supronal at 0·5, marbadal at 1 [loc. cit.], and badional at 8 per cent.

1715. Nordén (Å.). **The role of temperature in a Sporotrichum precipitin reaction.**—*Proc. seventh int. bot. Congr., Stockholm, 1950*, p. 422, 1953.

Using a polysaccharide and a crude autoclaved antigen from *Sporotrichum schencki*, the author studied the precipitin reaction at 5·5° to 8°, 24° and 35°

to 36° C. with a Libby photron-reflectometer. During the first few minutes flocculation was most rapid at the higher temperatures, but later on it was fastest at the lower.

1716. Kisch (B.). **Forgotten leaders in modern medicine. Valentin, Gruby, Remak, Auerbach.**—*Trans. Amer. phil. Soc.*, 44, 2, pp. 137–317, 68 figs., 1954.

This monograph includes interesting and detailed accounts of David Gruby (1810–1898) (pp. 193–226) and Robert Remak (1815–1898) (pp. 227–296), two pioneers of medical mycology.

1717. Ainsworth (G. C.). **Recent trends in human and animal mycopathology.**—*Atti VI Congr. int. Microbiol. Roma*, 5, 14, pp. 55–63, 1955.

In this paper, read before the sixth International Congress of Microbiology held in Rome in September, 1953, the author reviews the recent trends in human and animal mycopathology, laying special emphasis on the importance of the host-parasite relationship and environment. He cites from the literature instances of dimorphism in fungi, the effect of the host on the morphology of the pathogen, and the effect of nutrition on pathogenicity. He stresses the need for a greater number of workers and a wider field of study in medical mycology.

1718. Ainsworth (G. C.). **Fungoid infections of animals in Britain.**—*Vet. Rec.*, 66, pp. 844–849, 856, 1954.

This is a review of fungous infections in animals based on the author's article 'A survey of animal mycoses in Britain: general aspects' [see below, No. 1721].

1719. Ainsworth (G. C.). **Medical mycology in Great Britain and the Commonwealth.**—*Bull. int. Soc. hum. anim. Mycol.* 1, pp. 7–9, 1956.

In a survey of the major British contributions to medical mycology the author mentions this *Review*; the work of Balfour, Chalmers, and Archibald on mycetoma and other mycotic conditions at the Wellcome Tropical Research Laboratories at Khartoum; Vandyke Carter's pioneer study of mycetoma in India; the establishment of a mycological unit at the Provincial Laboratory of Public Health, Edmonton, Alberta, Canada; Cox and Tolhurst's monograph on torulosis (cryptococcosis), from Australia [1, No. 909]; the series of papers on tinea and other topics now coming from the University of Otago, New Zealand; the studies of allergy to air-borne spores at present in progress at the Asthma and Allergy Research Unit at Cardiff; and finally, Petch's studies of entomogenous fungi.

Medical mycology is a border-line subject where team work is essential. The British Mycological Society now proposes to devote one paper-reading meeting annually to fungi pathogenic to man and animals. The International Society for Human and Animal Mycology [see below, No. 1726] provides a good frame-work for international liaison.

1720. Ainsworth (G. C.) & Austwick (P. K. C.). **A survey of animal mycoses in Britain : mycological aspects.**—*Trans. Brit. mycol. Soc.*, 38, 4, pp. 369–386, 1955.

As the result of a two-year survey of fungi associated with diseases of farm animals in Great Britain approximately 1,200 fungi, belonging to 129 species, were isolated from diseased material. Of these, 28 species from approximately 300 cases were considered to be pathogenic or potentially so. Over half of the isolates belonged to the genera *Aspergillus*, *Absidia*, *Candida*, *Trichophyton*,

and *Penicillium*, with a preponderance of the thermophilic species *Aspergillus fumigatus* (comprising 19·6 per cent. of all the isolates) and *Absidia ramosa* (8·4). The data suggest that the skin harbours a greater variety of fungi than other parts of the animal body and illustrate the importance of yeasts as components of the mycoflora of the respiratory organs and alimentary canal, and of milk. There was evidence that mouldy hay may be an important source of animal pathogens. It is of interest that aerobic actinomycetes of uncertain pathogenic status were frequently isolated from both the skin and internal organs. An annotated list of pathogens or potential pathogens and a host index are included.

1721. Ainsworth (G. C.) & Austwick (P. K. C.). **A survey of animal mycoses in Britain : general aspects.**—*Vet. Rec.*, 67, pp. 88–97, 9 figs., 1955.

At University College, Exeter, 1,204 isolations of fungi were made from 657 cases of suspected mycotic infection from England, Scotland, and Wales. As pathogenicity tests could not be carried out, the evidence for pathogenicity was discussed with the veterinary officer concerned before a decision was made in doubtful cases. The majority of specimens came from farm or domestic animals and birds, but rabbits (2), guinea-pigs (2), mink (1), moles (1), pigeons (2), jackdaws (2), partridge (1), rooks (1), and woodpigeons (4) were a source of a number of specimens. Of the 125 different species of fungi isolated, 25 were considered to be pathogenic. Ringworm was the commonest disease found in animals, aspergillosis the commonest in birds [2, No. 1761]. The 79 proved cases of ringworm amounted to just under half the suspected cases and the reasons for this are discussed. The distribution of the cases and of the causative organisms is described. There appeared to be no seasonal variation in the incidence of cattle ringworm, and more adult animals were involved than calves; all these cases were caused by *Trichophyton discoides* [*T. verrucosum*]. This organism was also isolated from a horse which had been grazing with cattle. The incidence of ringworm in dogs and cats was highest in the winter. *Microsporum canis* was responsible for the majority of infections in cats, but this organism caused only half the infections in dogs, *T. mentagrophytes* being responsible for the remainder.

Avian aspergillosis affected the respiratory system of all but one of 85 cases for which the details are given. The diagnosis was confirmed in 107 of 140 suspected cases, *A. fumigatus* being responsible for the great majority. *A. flavus* was isolated twice, *A. niger* once, and *A. nidulans* four times. In fowls the incidence was highest from March to May, in ducks and geese the peak was in May and in turkeys it was in July. It is suggested that the reason for this may be that young birds are more susceptible to the disease, and at these times their numbers are greatest.

A. fumigatus was isolated from nodular lesions in the lungs of two guinea-pigs, and from the hay used for their bedding. An outbreak of mucormycosis in young guinea-pigs due to *Absidia corymbifera* and *A. ramosa* was encountered.

Moniliasis (*Candida albicans*) affecting principally young birds reached its highest incidence in fowls in March and in turkeys in July.

Mycotic abortion of cattle was investigated by the examination of foetal stomachs and adult reproductive organs. One or more of the recognized pathogens, *Aspergillus fumigatus*, *Absidia ramosa*, and *A. corymbifera* were encountered in the majority of cases, often with other fungi, presumably contaminants. *Cryptococcus neoformans* was found in one case, but there was not sufficient evidence to record the outbreak as cryptococcosis. The milk of cows with mastitis yielded 35 species of fungi, of which the three most common

were *Aspergillus fumigatus*, *Absidia corymbifera*, and *A. ramosa*, but *Candida krusei* occurred alone in six cases, of which three were penicillin resistant.

Numerous species were found in hay and fodder, and in the faeces of animals with intestinal disorders. *Absidia corymbifera* and *A. ramosa* occurred more frequently in the latter situation than the former.

Reference is made to a number of single isolations of fungi from various sites.

Haplosporangiosis was discovered in moles, the first time that *Haplosporangium parvum* has been isolated in Europe, and the mole is a new host. The organism was found in apparently healthy animals as well as in an epizootic.

1722. Ajello (L.). **Soil as natural reservoir for human pathogenic fungi.**—*Science*, 123, 3203, pp. 876–879, 1956.

Examination was made at the United States Public Health Service, Georgia, of 1,215 soil specimens, comprising 710 samples from Tennessee, 79 from Georgia, 48 from Arizona, 44 from Michigan, 16 from West Virginia, 11 from Maryland, 10 from Alabama, 100 each from the Territory of Hawaii and the Republic of Panama, including the Canal Zone, 76 from Nigeria, 12 from Canada, five from Venezuela, and four from Peru, collected since 1950. From 1,141 of the soils 73 isolates of *Histoplasma capsulatum* were obtained—67 from Tennessee, one from Panama [2, Nos. 1253, 1254], four from a Venezuelan cave, and one from a Peruvian cave [2, No. 1828]. *Allescheria boydii* was recovered from 19 samples, 15 from Tennessee, two from Georgia, and one each from Panama [2, No. 1253] and Hawaii. *Cryptococcus neoformans* was isolated from five samples from Tennessee, two each from Georgia and Alabama, and one each from Maryland, Hawaii, and Nigeria. One isolate of *Candida albicans* was recovered from Tennessee soil and *Coccidioides immitis* was found in soil collected from a rodent burrow in Arizona. By baiting 439 of the soil samples with filaments of hair, 126 isolates of *Microsporum gypseum* were recovered—36 from Panama [loc. cit.], 30 from Tennessee, 23 from Hawaii, 13 from Georgia, six from Nigeria, five from Michigan, three from Alabama, and two each from West Virginia and Canada.

In Tennessee, *H. capsulatum* was recovered from 38·9 per cent. of the soil samples from chicken-runs and only 13 per cent. from other habitats. The fungus occurred in 46·2 per cent. of the chicken-house soils and only 20 per cent. in chicken-yard soils [cf. 2, No. 1259]. Chickens are not, however, carriers of *H. capsulatum*. Soils from chicken areas were found to be more acid than soils negative for *H. capsulatum* and had a significantly higher organic carbon content and moisture-holding capacity than soils from other habitats. It should be possible to prevent acute epidemics of histoplasmosis by disseminating information on the infectivity of soil from chicken and pigeon habitats. The author considers that *A. boydii*, one of the common causes of mycetoma, is widespread in nature. A bibliography of 50 titles is appended.

1723. Atkins (D.). **Further notes on a marine member of the Saprolegniaceae, Leptolegnia marina n.sp., infecting certain invertebrates.**—*J. mar. biol. Ass. U.K.*, 33, pp. 613–625, 5 figs., 1954.

A full technical description is given of a destructive fungus parasite on the pea crab (*Pinnotheres pisum*) taken from mussels (*Mytilus edulis*) obtained from the Camel estuary, north Cornwall, near the junction of the Tamar and Tavy (Weir Point, on the Cornwall-Devon border), and from the Yealm estuary, south Devon [*Rev. appl. Mycol.*, 8, pp. 720–721, 1929]. The organism is named *Leptolegnia marina* n.sp.

1724. Atkins (D.). **A marine fungus Plectospira dubia n.sp. (Saprolegniaceae), infecting crustacean eggs and small Crustacea.**—*J. mar. biol. Ass. U.K.*, 33, pp. 721–732, 5 figs., 1954.

A full description is given of a marine fungus, *Plectospira dubia* n.sp., found infecting crustacean eggs and small Crustacea in the Laboratory of the Marine Biological Association, Plymouth.

1725. Coudert (J.). **Guide pratique de mycologie médicale.** [Practical guide to medical mycology.]—xiv+364 pp., 8 pl., Paris, Masson et Cie., 1955. Fr. 5,200 (bound 6,000).

This useful treatise, preceded by a table recapitulating the principal mycotic syndromes with indications for the collection of specimens, modes of examination, identity of the causal organisms, and therapy, comprises three parts. The first is concerned with methods of isolation and culture (both general and specific to certain groups), the inoculation of laboratory animals, immunological diagnosis, and the assay of antimycotics. The second part contains various dichotomous keys, some to serve for the rapid diagnosis of the more common species, while others, more complete, are intended for a systematic diagnosis of the genera and species parasitic on man. In the third part a methodical description is given of nearly 450 pathogenic species, with notes on their clinical aspects, macro- and microscopic appearances in culture, epidemiology, the results of animal experiments, and other points of interest. A glossary is appended.

1726. **The International Society for Human and Animal Mycology.**—*Mycologia*, 47, 4, p. 612, 1955.

The International Society for Human and Animal Mycology was founded in Paris on 6th July, 1954, by a group of scientists representing ten different nations, assembled on the occasion of the Eighth International Botanical Congress. The objects are to bring together qualified persons interested in the study of fungi on human beings and animals; to encourage the formation of regional groups of such persons; to organize meetings on the occasion of International Congresses; and to publish a bulletin devoted to human and animal mycology. Prospective members should apply to the General Secretary, Dr. R. Vanbreuseghem, Institut de Medicine Tropicale, Antwerp, Belgium, giving details of their qualifications and a list of their scientific publications.

1727. Kligman (A. M.) & Lewis (Florence S.). **A method for preparing permanent stained mounts of pathogenic fungi for microscopic examination.**—*J. Bact.*, 65, 2, pp. 148–150, 4 figs., 1952.

At the University of Pennsylvania School of Medicine, Philadelphia, a simple modification of Riddell's method (*Mycologia*, 42, pp. 265–270, 1950) was developed for obtaining permanently stained specimens of medical fungi by growing them on the surface of cover slips and staining with basic fuchsin. The cover slips are placed in a Petri dish on cylinders of inoculated agar media and the mycelium grows from the periphery on to the slip. The method is particularly useful for teaching and research purposes.

1728. Lövei (E.), Bretán (N.), Antalóczy (Z.), Sommer (S.), & Csiky (T.). **Über die Pathogenese der durch Mykosen verursachten inneren Krankheiten** [On the pathogenesis of the internal diseases caused by mycoses.]—*Z. ges. inn. Med.*, 10, 9, pp. 449–452, 1955.

On the basis of their experience at the Medical Clinic of the University of Budapest, Hungary, and consultation of the pertinent literature the authors

discuss the pathogenesis of endogenous and exogenous mycoses, the former represented by the saprophytes *Candida albicans*, *Torula* [*Cryptococcus*] *neoformans*, *Geotrichum* sp., and *Actinomyces* Wolff-Israel [*A. israeli*] and the latter by *Sporotrichum* spp., *Histoplasma* [*capsulatum*], *Coccidiomyces* [*Coccidioides immitis*], *Blastomyces dermatitidis*, *B.* [*Paracoccidioides*] *brasiliensis*, *Nocardia* sp., and *Aspergillus* sp.

Local infections by the endogenous species may originate as a secondary illness in a weakened system or in consequence of antibiotic therapy, e.g., with aureomycin, terramycin, or chloromycin [chloramphenicol]. Their generalization is favoured by a serious development of the basic disease; a change in the immuno-biological status of the system, in the direction of anergy or acidosis, for instance; and antibiotic therapy. The exogenous mycoses may become disseminated in cases of massive infection, debilitation and anergy of the constitution, and involvement of the circulatory system.

1729. Reis (J.) & Nobrega (P.) with the collaboration of Bueno (R. C.), Reis (A. S.), & Giovannoni (M.). **Doenças de Aves em São Paulo. Analise de 17,753 cases.** [Diseases of Birds in São Paulo. Analysis of 17,753 cases.]—*Arq. Inst. biol., S. Paulo*, 22, 13, pp. 119–160, 2 figs., 12 graphs, 1955. [English summary.]

During the period from 1933 to 1953, inclusive, fungi were involved in a total of 81 cases of avian infection investigated at the Poultry Diseases Department of the Biological Institute, São Paulo, Brazil, viz., five of moniliasis (*Candida albicans*); 18 of favus (*Achorion* [*Trichophyton*] *gallinae* in all but one, which was due to *A. passerinum*); one of mucormycosis attributed to a species of the Mucorineae; and 57 of aspergillosis (*Aspergillus flavus* in two, *A. fumigatus* in the remainder).

1730. Repetto (O. M.). **Acción fungistática de los productos de cracking del aceite de hígado de bacalhao.** [Fungistatic action of the products of cod-liver oil obtained by cracking.]—*Rev. Inst. Bact., B. Aires*, 16, 1, pp. 60–64, 1954.

In *in vitro* experiments at the Instituto Malbrán, Buenos Aires, Argentina, an appreciable fungistatic action was exerted by the fractions of cod-liver oil obtained by the destructive distillation method of Solomides (*Ann. Inst. Pasteur*, 78, p. 227, 1950) on two strains of *Sporotrichum* (not *S. schencki*), *Trichophyton flavum*, *T. mentagrophytes*, *T. rubrum*, *Microsporum canis*, *Histoplasma capsulatum*, and *Coccidioides immitis*. In the case of the two last-named species the acid fraction was much more active than the unsaponifiable. *H. capsulatum* was the more sensitive of the two, being inhibited at a concentration of 40 μg. per ml. as compared with a sixfold higher strength for *C. immitis*.

1731. Wilson (Katherine S.) & Cutter (V. M.). **The effect of 1,2,3,4-tetrahydrofluorenone on fungal pathogens.**—*Proc. eighth int. Congr. Bot., 1954*, pp. 121–122, 1954.

In vitro studies at Yale University and the University of North Carolina showed that *Trichophyton mentagrophytes*, *T. rubrum*, *Microsporum audouini*, *Cryptococcus neoformans*, and *Candida albicans* were highly sensitive to 1,2,3,4-tetrahydro-fluorenone (THF); the action of this compound was not only inhibitory but fungicidal. *T. mentagrophytes*, *T. rubrum*, and *M. audouini* were markedly inhibited, activity against *Cryptococcus neoformans* was somewhat less, and *Candida albicans* was the least affected. With 5 per cent. tween-80 as solvent, the compound gave 100 per cent. increased inhibition. When used against certain plant pathogens the product also showed inhibitory powers.

1732. Zimmerman (L. E.). **Fatal fungus infections complicating other diseases.**—*Amer. J. clin. Path.*, 25, 1, pp. 46–65, 10 figs., 1955.

Studies at the Armed Forces Institute of Pathology, Washington, revealed that fatal fungus complications of other diseases are brought about by diminished resistance of the patient, either local or general, and considerable attention is now being paid to the part played by modern therapy in altering the microbial flora [2, No. 1144]. *Aspergillus* generally infects the lungs by the respiratory tract, but may be spread from the stomach by the blood-stream. Generalized dissemination of *Candida* occurs from the gut as a rule, and the suppression of the normal bacterial flora by antibiotics allows the fungus increased scope for multiplication [2, No. 1610 and below, Nos. 1873–6]. A series of 175 autopsies of children suffering from acute leukaemia who received various modern drugs yielded thirteen disseminated infections, of which eleven were caused by *Candida*. Cryptococcosis [*Cryptococcus neoformans*] and histoplasmosis [*Histoplasma capsulatum*] occur principally in cases with reticuloses, and there is no evidence that modern therapeutics are increasing their incidence. Of 74 cases of cryptococcal infection 24 occurred as complications of malignant reticulosis, and of 29 cases of histoplasmosis, seven were associated with malignant reticuloses, and eight with tuberculosis. Two cases of Hodgkin's disease were infected by both fungi.

Mucormycosis [*Mucor* sp.] in diabetes [2, No. 1627, and below, No. 1919], infecting the brain by way of the orbit or the nose is well known, but it has also been seen complicating malignant diseases, burns, infantile diarrhoea, and antibiotic therapy. Illustrative case reports and photomicrographs accompany the article.

1733. Fazakas (A.). **Okulomykosen und ihre Behandlung.** [Ocular mycoses and their treatment.]—*Klin. Mbl. Augenheilk.*, 127, 6, pp. 701–721, 1955.

Some of the fungi studied by the author in connexion with diseases of the eye at Debrecen, Hungary, have already been listed [2, Nos. 663, 664]. Others include *Aspergillus fumigatus*, *A. flavus*, *Mucor cornealis*, *Rhizomucor parasiticus*, and *Cryptococcus hominis* [*C. neoformans*], all involving the cornea.

1734. Sachsenneger (R.). **Klinische Befunde und experimentelle Untersuchungen über Augenerkrankungen durch saprophytär wachsende Pilze.** [Clinical findings and experimental studies on eye diseases caused by saprophytically growing fungi.]—*Klin. Mbl. Augenheilk.*, 127, 6, pp. 721–730, 4 figs., 1955.

From the Eye Clinic of the University of Halle, Germany, the author describes three cases of conjunctivitis, two in 13-year-old girls and the third in a 12-year-old boy, induced by subconjunctival injections of sodium chloride solution contaminated by fungi. The species isolated were *Endomycopsis fibuliger*, *Monoverticillium ramigenum* or *M. asymmetricum*, and a member of the Fungi Imperfecti. Quite a number of saprophytic fungi were found to grow freely in chemically pure solutions of up to 10 per cent. sodium chloride. In cases of individual predisposition, the use of such solutions may result in the development of inflammatory conditions which are liable to persist for months, due less to the virulence of the fungi concerned than to their degeneration products.

1735. Avery (R. J.) & Blank (F.). **On the chemical composition of the cell walls of the Actinomycetales and its relation to their systematic position.**—*Canad. J. Microbiol.*, 1, 2, pp. 140–142, 1954.

Chemical analysis of washed and dried cultures of *Actinomyces bovis*, *A. israeli*, *Nocardia asteroides*, *Streptomyces albus*, *S. griseus*, and *Micromonospora*

chalcea, conducted by the Department of Bacteriology and Immunology, McGill University, Montreal, indicate that the Actinomycetales have nothing in common with the true fungi but rather with bacteria. Morphological data also suggest that they should be placed among the bacteria.

1736. Baldacci (E.), Grein (A.), & Spalla (C.). **Osservazioni sull' impiego dei terreni Bacto e proposta di un sustrato Czapek alla caseina, come standard per le colture di Attinomiceti.** [Observations on the use of bacto media and a proposed Czapek medium containing casein, as a standard for the culture of Actinomycetes.]—*Nuovi Ann. Igiene Microbiol*, 5, 4, pp. 296–298, 1954.

When 29 strains of actinomycetes were grown on bacto thiamine assay medium (dehydrated), bacto riboflavin assay medium (dehydrated), bacto pyridoxine assay medium (control), bacto B assay medium USP (dehydrated), bacto niacin assay medium (dehydrated), bacto pantothenate assay medium (dehydrated), bacto *Neurospora* culture agar (dehydrated), Czapek's agar with purified bacto casein as a source of nitrogen, and Czapek's agar with bacto casamin-acids without a vitamin source of nitrogen it was found that the presence of vitamins did not modify the known cultural characters of the organisms. Some of the media proved too acid for the culture of the test organisms. The bacto media did not give a better characterization of the actinomycetes studied than did the usual, natural media, but had the advantage that the characters of the organisms cultured on them remained constant for a longer period than on ordinary media. The authors suggest that the potato-agar medium generally used hitherto for the culture of actinomycetes should be replaced by a Czapek's medium with casein, though the other media tested should be retained where an organism is to be compared with descriptions by earlier workers.

1737. Brion (S.), Delaveau (P.), & Guiot (G.). **Actinomycose du système nerveux central due à Nocardia asteroides.** [Actinomycosis of the central nervous system caused by *Nocardia asteroides*.]—*Sem. Hôp., Paris*, 31 (iii), 66, pp. 2899–2904, 4 figs., 1955.

A fatal illness due to infection of the nervous system by *Nocardia asteroides* [2, No. 1169], reported from the Hôpital Foch, Suresnes, near Paris, followed an accident to a 45-year-old man involving fractures of two bones in the left arm and the left parietal bone. Inoculation experiments on a guinea-pig and a rabbit gave positive results. The clinical course of the disease and the morphological and cultural characters of the fungus are described. The 29 analogous cases described in the relevant literature are briefly reviewed.

1738. Delarue (J.). **A propósito de algunos casos de actinomicosis pulmonar.** [With reference to some cases of pulmonary actinomycosis.]—*Rev. mex. Tuberc.*, 16, 3, pp. 232–242, 1955. [English and French summaries.]

The author's contribution to the sixth National Congress of Tuberculosis and Silicosis, held in Mexico City from 23rd to 29th January, 1955, was a review of 23 cases of pulmonary actinomycosis (*Actinomyces israeli*) observed in France. Infection is not confined to the lungs but also involves the mediastinum. A large sclerotic zone surrounding all the elements is a characteristic feature of the disease; in the centre of this pulmonary cirrhosis are a variable number of purulent foci formed by the actinomycotic abscesses.

Clinical symptoms include fever, cough, spitting of blood, and thoracic pain. Auscultation and radiography reveal no specific changes, but Neuter's intradermo-reaction appears to be of considerable diagnostic value. The initial 'laryngeal encasing' and the biopsy of metastatic skin lesions also yielded important confirmatory evidence in suspected cases. The best results in the

therapy of the disease have been obtained with sulpha drugs and penicillin [cf. 2, No. 1450].

1739. Gale (D.) & Waldron (C. A.). **Experimental actinomycosis with Actinomyces israeli. The development of visceral actinomycosis.**—*J. infect. Dis.*, 97, 3, pp. 251–261, 1955.

Seven strains of *Actinomyces israeli* from human sources were used in the experiments on white Swiss, black C 57, and grey-brown mice described in this joint report from the Veterans' Administration Hospital, Albuquerque, New Mexico, and the Washington University School of Dentistry, St. Louis, Missouri. Two were from cases of cervico-facial actinomycosis, two from periodontal disease, and three from normal mouths. The fungal suspensions were injected intraperitoneally with an adjuvant of mucin or nutrient broth: where the former was used the liver was the principal site of lesions, while the latter induced the formation of infection foci primarily in the omentum and mesenteries. Extensive invasion of the liver had occurred by the third day after inoculation and of the omentum and mesenteries by the fifth. In another series of tests with a mixture of *A. israeli* and saline the omentum and mesenteries were involved on the seventh day after inoculation. Cultures were readily obtained from the lesions in all the diseased organs. The organism was present in the blood in nearly all the mice examined on the second day after inoculation and in several on the ninth.

The results obtained in a comparative series of tests on guinea-pigs were less satisfactory, repair and resolution of the lesions generally occurring within a fortnight of the operation.

1740. Gorrill (R. H.) & Heptinstall (R. H.). **The animal pathogenicity of Nocardia sebivorans nov. spec. With an addendum by** D. Erikson.—*J. Path. Bact.*, 68, 2, pp. 387–393, 2 figs., 1954.

A new species of *Nocardia* isolated from pus from an empyema in Salonika is described and named *N. sebivorans*. The organism was highly pathogenic to rabbits, and also infected guinea-pigs and occasionally mice.

1741. Greene (L. W.) & Black (W. C.). **Treatment of cervico-facial actinomycosis with isoniazid.**—*Rocky Mountain med. J.*, 52, 1, pp. 43–46, 2 figs., 1955.

A further case of successful treatment of actinomycosis caused by *Actinomyces bovis* [*A. israeli*] is reported from Colorado in a 34-year-old married woman affected in the cervico-facial region [2, No. 1447]. The pathogen was readily identified by fixing the exudate in formalin, embedding it in paraffin, and sectioning the sediment, as well as by growing it in culture. It may be tested for antibiotic sensitivity by adding serial dilutions of isoniazid to liquid culture media. An apparent cure was effected by giving 300 mg. of the drug orally as nydrazid [cf. 2, No. 236] for three days, 500 mg. for ten days, 900 mg. for $2\frac{1}{2}$ months, 300 mg. daily for another month and then, as the swelling and sinus discharge disappeared, a reduced dosage of 300 mg. every tenth day for about another six weeks. Two subsequent radiographic examinations and two physical examinations have revealed no ill effects from the high drug dosage but the importance of frequent examinations for toxicity symptoms is stressed.

1742. Hidalgo de Pablo-Blanco (M.) & Montero Rodríguez (P.). **Investigaciones sobre actinomicosis pulmonar.** [Investigations on pulmonary actinomycosis.]—*Rev. esp. Tuberc.*, 23, 233, pp. 427–438, 3 figs., 1954. [French summary.]

A co-operative investigation between the National School of Physiology and

the Helios Sanatorium, Guadarrama, [Spain], revealed that *Nocardia* spp. from the sputum of a patient with pulmonary actinomycosis produced widespread infection in both lungs of intratracheally inoculated rabbits. The rabbits were killed after 20 days and the infection confirmed by histopathological examination. This appears to be a selective and very rapid means of isolating the pathogen and diagnosing the disease.

1743. Hinds (E. C.) & Degnan (E. J.). **The use of achromycin and neomycin in the treatment of actinomycosis.**—*Oral Surg.*, 8, 10, pp. 1034–1038, 5 figs., 1955.

Current methods of therapy of actinomycosis [2, No. 1448] are briefly reviewed in the light of five contributions to the relevant literature. A case of the cervico-facial type, caused by *Actinomyces bovis* [*A. israeli*] and involving the right temple in a 43-year-old patient, is reported from the Veterans' Administration Hospital and the University of Texas Dental School, in which highly satisfactory results were obtained by the combined use of achromycin and neomycin.

1744. Ladjimi (R.) & Khalfat (A.). **Pied de Madura.** [Madura foot.]—*Tunis. méd.*, 34, 4, pp. 321, 323, 1 fig., 1956.

An inflammatory tumour of six years' standing on the right foot of a 46-year-old Tunisian native was found to be caused by a species of *Actinomyces*.

1745. Eberhartinger (C.). **Ein Fall von Aktinomykose und Carcinom.** [A case of actinomycosis and carcinoma.]—*Z. Haut- u. Geschlechtskr.*, 21, 3, pp. 67–68, 1 fig., 1956.

A case is reported from the Dermatological Clinic of the University, Vienna, of combined long-standing primary actinomycosis (*Nocardia* sp.) and secondary carcinoma of the sacrum in a 47-year-old male. Therapy consisted in the administration of penicillin and streptomycin followed by excision of the entire fistulating process.

1746. Mackinnon (J. E.) & Artagaveytia-Allende (R. C.). **The main species of pathogenic aerobic actinomycetes causing mycetomas.**—*Trans. R. Soc. trop. Med. Hyg.*, 50, 1, pp. 31–40, 2 pl., 1956.

In this study at the Institute of Hygiene, Montevideo, Uruguay, of the characteristics of cultures and the histological appearances of grains of 38 strains of *Nocardia somaliensis*, *N. pelletieri*, *N. madurae*, *N. brasiliensis*, and *N. asteroides* the principal criteria for identification of the fungi are clearly defined. They include morphology and structure of the grains, affinity of the filaments for haemalum, and their acid-fastness. Thus, the grains of *N. madurae* are serpiginous and usually lacunar or hollow while those of *N. somaliensis* are compact owing to the presence of an interstitial substance and a sheath, the colour being white to yellowish or pinkish in the former and yellowish in the latter species. The grains of *N. pelletieri* are uniformly red, irregular, with smooth or denticulated edges, hard, and composed of lobules with geometrical shapes. Clubs are absent in the grains of *N. somaliensis* and *N. pelletieri* but may be present in those of other species. The filaments of the semi-acid-fast *N. brasiliensis* do not react to the haemalum stain.

The problems of determination of the causative fungi of mycetoma have been simplified by a reduction in the number of species. Thus, a study of the original strain of *N. paraguayensis* Almeida (*Mycopathologia*, 2, p. 201, 1940) demonstrated its affinity with *Streptomycesalbus* and other common *S.* spp. Among the species regarded as synonyms of *N. madurae* are *Actinomyces brumpti* and *Discomyces bahiensis*. Erikson's identification of *N. genesi* with *N. pelletieri*

(*Spec. Rep. med. Res. Coun.* 203, 1935) is accepted. Information is presented on the geographical distribution of the various species and on the results of animal inoculation experiments.

1747. Yannopoulou (Mme K.) & Thiry (S.). **Étude anatomo-clinique d'un cas d'actinomycose cérébrale.** [Anatomo-clinical study of a case of cerebral actinomycosis.]—*Acta neurol. psychiatr. belg.*, 55, 6, pp. 505–512, 4 figs., 1955. [German and English summaries.]

This is a detailed report from the Hôpital de Bavière, Liège, Belgium, of a fatal case of cerebral actinomycosis (*Actinomyces bovis*) [*A. israeli*] in a 31-year-old male [2, No. 1443]. In the course of ten years the organism successively invaded the orbital cavity, the base of the skull, and the pituitary fossa, eventually producing an abscess on the left temporal lobe.

1748. Coode (C. D.). **A case of actinomycosis.**—*J.R. nav. med. Serv.*, 142, 2, pp. 87–92, 1 fig., 1956.

A typical case of cervical actinomycosis (*Streptothrix actinomyces*) [*Actinomyces israeli*] associated with dental sepsis [2, No. 1458] in an 18-year-old stoker mechanic is reported from the Royal Naval Hospital, Haslar. The correct diagnosis was not established until five months after the onset of the illness. The clinical features of the disease are reported, with notes on some unusual cases from the revelant literature, and Armitage and Smith's suggestions for treatment (*Brit. J. Surg.*, 171, p. 77, 1954) are summarized.

1749. Schlomka (G.). **Zur sozialrechtlichen Entschädigungspflicht der Aktinomykose.** [Liability to compensation in actinomycosis.]—*Dtsch. Gesundheitswes.*, 10, 24–25, pp. 850–852, 1955.

The author was called upon for expert opinion in the case of a young woman office employee, who had developed tonsillitis after a fortnight's work at the corn harvest, and who nine months later was operated upon for acute appendicitis, which the later discovery of a paranephritic abscess indicated to have been of actinomycotic origin. The patient claimed compensation on the grounds that the actinomycosis originated at the time of the tonsillitis and probably resulted from the inhalation or swallowing of dust or awns from the corn in the course of harvesting. The author rejected this on the grounds that actinomycosis had first manifested itself at the time of the appendicitis, and that to support the claim he would be obliged to accept that the incubation period had been nine months, whereas present experience indicated a period of at most four or five weeks. Other aspects of actinomycosis, arising from discussion of the case, and useful in consideration of claims for compensation were also referred to.

1750. Moss (A. C.). **Nocardiosis (actinomycosis) in the Dog. A report of six cases.**—*J. Amer. vet. med. Ass.*, 128, 3, pp. 143–148, 8 figs., 1956.

A tabulated report is presented from the School of Veterinary Medicine, Colorado A and M College, Fort Collins, on six cases (one experimental) of nocardiosis (*Nocardia asteroides*) in dogs [cf. 2, No. 1468].

1751. Savage (A.) & Isa (J. M.). **Tracheal actinomycosis in a Dog.**—*Cornell Vet.*, 46, 2, pp. 216–218, 1 fig., 1956.

A case of tracheal actinomycosis (*Actinomyces* sp.) in an eight-year-old crossbred female retriever is reported with autopsy and microscopic findings from the Veterinary Laboratory, Winnipeg, Canada. The diagnosis was based on the occurrence of acid-fast, eosinophilic rosettes scattered throughout the pinkish-

grey, firm, finely nodular tumour in the trachea; otherwise the apparent absence of mycelium and the gram-negative staining reaction would have pointed to actinobacillosis. In any case, both conditions are sufficiently rare in dogs to justify this record.

1752. Nisbet (D. I.) & Bannatyne (C. C.). **A dermatitis of sheep associated with an organism of the genus Actinomyces.**—*Vet. Rec.*, 67, pp. 713–715, 1955.

A description is given of an outbreak of dermatitis in a flock of Blackface sheep on a hill farm in Argyllshire in 1953–4 and again in 1954–5. An organism resembling *Actinomyces dermatonomus* [Nisbet (D.I.). Thesis, Univ. Edinburgh, 1954] was isolated from the lesions produced on experimental sheep and from the original material [2, Nos. 1717, 1753].

1753. Kane (G. J.), Downing (W.), & Wilsdon (A. J.). **Mycotic dermatitis in Great Britain.**—*Vet. Rec.*, 67, p. 779. 1955.

The authors report the occurrence of mycotic dermatitis ('lumpy wool') in Great Britain. The disease was suspected on clinical grounds in 1949 in a flock of Suffolks in Somerset. In 1954, 40 per cent. of a flock of Clun Forest sheep in the same county developed a condition strongly resembling mycotic dermatitis as seen overseas (Bull, L. B., *Austr. J. exp. Med.*, 6, 3, p. 301, 1929; Mason & Bekker, J. G., *Onderstepoort. J. vet. Sci.*, 3, 1, pp. 211–216, 1934). An organism resembling that described by Bull was isolated, and the disease transmitted to healthy sheep [see preceding abstract].

In 1955 there were outbreaks throughout the country, especially in the high rainfall areas of the west, and the organism was definitely identified as *Actinomyces dermatonomus*. Heavy rainfall after shearing produced a flare-up of the disease, which was obvious on the shorn sheep, but this was checked by the dry summer. The lesions were mild, consisting of a crust of scab material about 3 mm. thick over the back and flanks. Scabs are often weathered out during dry weather, but during periods of heavy rain form a dense band which remains in the fleece, protected by the winter growth of wool. The organisms in this band act as a reservoir, producing recurrences of the disease whenever the weather conditions are such as to maintain a sufficiently high moisture content in the fleece.

The condition, which has been observed in the breeds Clun Forest, Kenny Hill, Suffolk, Southdown, and Shropshire, and is most prevalent in clay districts and areas of heavy rainfall, is distinct from that described by Nisbet and Bannatyne [loc. cit.] in that the lesions are those of a mild dermatitis of the woolled areas of the back and sides, with no gross tissue changes or pyogenesis.

1754. Meyer (A.), Monod (O.), Pesle (G.), Roy (L.), Zivy (P.), & Kuentz (J.). **L'aspergillome bronchique (trois nouvelles observations).** [Bronchial aspergilloma (three new observations).]—*Bull. Soc. méd. Hôp. Par.*, Sér. 4, 72, 19–20, pp. 554–570, 11 figs., 1956.

This is a detailed clinical report, followed by a discussion of some of the problems involved, of two further cases (female aged 52 and male factory-worker, 56) of bronchial aspergilloma (*Aspergillus fumigatus*) in Paris [2, Nos. 955, 1155], with a brief reference to a third, to be described elsewhere.

1755. Batista (A. C.), Maia (H. da S.), & Alecrim (I. da C.). **Onicomicose produzida por 'Aspergillus clavato-nanica' n.sp.** [Onychomycosis induced by *Aspergillus clavato-nanica* n.sp.]—*An. Fac. Med. Recife*, 15, 2, pp. 197–203, 6 figs., 1955.

Aspergillus clavato-nanica n.sp., isolated at the Department of Mycology,

University of Recife, Brazil, from a case of onychomycosis in a laundress, is characterized on Czapek's agar by hyaline, continuous conidiophores measuring 22 to 125 by 5 to 22 μ; uniseriate, lageniform sterigmata, 3 to 6·5 by 2 to 3 μ; and radiating 'heads', 145 to 360 by 120 to 180 μ, of ellipsoid or cylindrical, yellow to greenish conidia, 3·8 to 5 by 2·8 to 3·5 μ. Intercalary, globose chlamydospores, 10 to 12·5 μ in diameter, were formed only on maize steep agar. The cultural and morphological characters of the fungus on the latter medium and malt agar are also described.

1756. Alecrim (I. da C.) & Vital (A. F.). **O Aspergillus sydowi (Bain. & Sart.) Thom e Church numa lesão ungueal.** [*Aspergillus sydowi* (Bain. & Sart.) Thom & Church in an unguinal lesion.]—*An. Fac. Med. Recife*, 15, 2, pp. 229–240, 15 figs., 1955. [English summary.]

Particulars are given of the cultural and morphological characters on Czapek's, maize steep, and malt agars of *Aspergillus sydowi*, isolated at the Department of Mycology, University of Recife, Brazil, from the nails of a 24-year-old female cook.

1757. Fabricant (N. D.). **Otomycosis.**—*Eye, Ear, Nose Thr. Mon.*, 34, 8, p. 519, 1955.

Essential information on the symptoms, etiology, and therapy of otomycosis is summarized. At least 53 different species of fungi have been reported as agents of the complaint, some 90 per cent. of the cases being attributed to *Aspergillus* spp., principally *A. niger*, *A. flavus*, and *A. nidulans*. Among the remedies in common use are metacresyl acetate with or without the addition of a 2 per cent. solution of thymol, a 2 per cent. solution of salicylic acid in alcohol, and aniline dyes, including 1 per cent. brilliant green, 1 per cent. gentian violet, and triple dye.

1758. Montreuil (F.). **Fungus infection of the antrum.**—*J. Laryng.*, 69, 8, pp. 559–566, 5 figs., 1955.

Fungal infection of the paranasal sinuses would appear to be infrequent, only 17 cases having been reported in the relevant literature to date. *Aspergillus fumigatus* is the organism commonly implicated, but in the author's patient, a 34-year-old female professional singer resident at Montreal, Canada, identification proved impossible. The condition was successfully treated by the Coldwell-Luc operation.

Radiological findings tend to be misleading in cases of aspergillosis, necessitating strict attention to clinical symptoms.

1759. Lallemand (M.) & Giusiano (L.). **L'aspergillose pulmonaire ; à propos d'un nouveau cas.** [Pulmonary aspergillosis; on a new case.]—*Marseille méd.*, 91, 7, pp. 497–503, 2 figs., 1954.

Details are given of a case of pulmonary aspergillosis [2, No. 1190] in a female patient aged 40 years, already affected for some years by diabetes [cf. next entry], who had sought advice after she had been spitting blood at irregular intervals over a period of some months. Radiographs showed a small irregular lesion in the left subclavicular region, and in the middle region a round, apparently homogeneous opacity about the size of a walnut. The evidence from tomograph sections indicated the presence of pulmonary aspergillosis, and *Aspergillus fumigatus* was twice isolated from the sputum. Treatment with iodine, iodides, and terramycin (2 gm. per day for ten days) had no effect on the radiological picture. The paper concludes with a discussion of the etiology, clinical features, development, pathological anatomy, and treatment of pulmonary aspergillosis, based on the literature.

1760. Redaelli (P.), Rossi (L.), & Palazzi (D.). **Bronco-pneumicosis aspergillari nell' Uomo e trattamento antibiotico.** [*Aspergillus* broncho-pneumomycosis in Man and antibiotic treatment.]—*Arch. ital. Anat. Istol. patol.*, 28, pp. 329–341, 3 figs., 1954.

Anatomical and histopathological details are presented of two cases of pulmonary infection by an [unidentified] species of *Aspergillus* found during post-mortem examination. Both cases occurred in male patients in Lombardy, Italy; one patient, aged 73, admitted to hospital suffering from diabetic coma [cf. preceding abstract], had been treated (before admission) with penicillin for a feverish condition, and the other, 56, admitted to hospital with bronchitis and myocarditis, was treated with penicillin and had probably been treated with it before admission. It is thought that the selective action of the penicillin on the broncho-pulmonary flora may have stimulated the infection by the *Aspergillus*.

1761. McDiarmid (A.). **Aspergillus in freeliving wild Birds.**—*J. comp. Path.*, 65, 3, pp. 246–249, 1 pl., 1955.

Eighteen cases of aspergillosis were confirmed at the Field Station of the Agricultural Research Station, Compton, Berkshire, during the period 1943 to 1953 in free-living, wild birds [cf. 2, No. 1721]. Of these, three were the herring-gull (*Larus argentatus*), one the jackdaw (*Corvus monedula spermologus*), and 14 the wood-pigeon (*Columba palumbus*). In all the cases except one, the causal agent was *Aspergillus fumigatus*, the exception being *A. nidulans*, which was found in a wood-pigeon. The lesions were in all cases extensive, involving most of the viscera. The macroscopic lesions in all the herring-gulls consisted mainly of characteristic plaques throughout the thoracic and abdominal viscera. Rabbits inoculated intravenously with suspensions of cultures from these gulls died after 11 days. The pathological picture in the jackdaw resembled that in the herring-gulls, but the lesions in the wood-pigeons, principally localized in the peritoneal cavity, ranged from typical concentric plaques to large, irregular, necrotic nodules, most marked in the livers of some of the birds. Involvement of the respiratory tract was less obvious in the wood-pigeons than in the other two species.

1762. Chute (H. L.), Witter (J. F.), Rountree (J. L.), & O'Meara (D. C.). **The pathology of a fungous infection associated with a caponizing injury.**—*J. Amer. vet. med. Ass.*, 127, 942, pp. 207–209, 2 figs., 1955.

Aspergillus fumigatus was found to be responsible for systemic infection in White Rock cockerels [2, No. 696] at Orono, Maine. The birds were caponized at four weeks old and the first deaths occurred a week later. The fungus was isolated on Sabouraud's medium from the liver, air sacs, and other areas close to the excision, which is presumed to have been contaminated during the operation. A respiratory infection was induced in a chick [2, No. 1191] with a subculture from the original isolate. The Gridley stain [2, No. 445] is considered to be superior to haematoxylin and eosin for the detection of fungi in tissue.

1763. Dereymaeker (A.), & De Somer (P.). **Arachnoidite fibropurulente cérébello-cervicale due à une moisissure (Cladosporium).** [Fibro-purulent cerebello-cervical arachnoiditis due to a mould (*Cladosporium*).]—*Acta neurol. psychiatr. belg.*, 55, 8, pp. 629–632, 1 fig., 1955.

A case of spino-cerebellar arachnoiditis caused by *Cladosporium trichoides* [2, No. 1640] is reported from Louvain, Belgium. The patient was a 32-year-

old coal-miner, and it is surmised (though without definite proof) that infection was contracted in the course of his occupation. The immediate results of surgical intervention were favourable, but death occurred unexpectedly six weeks later.

1764. Wortmann (F.). **Untersuchungen über den Gehalt der Luft an Schimmelpilzsporen in Basel und Samaden (Engadin).** [Studies on the mould content of the air in Basle and Samaden (Engadine).]—*Acta allergol.*, 9, 1, pp. 45–52, 3 graphs, 1956. [English summary.]

During the year 1954 the numbers of fungus colonies trapped on beer wort agar plates in Basle and Samaden (near St. Moritz), Switzerland, were 3,504 and 1,934, respectively. In both places the peak incidence was reached between June and September. *Hormodendrum* sp. predominated in the city, whereas in the Engadine species of *Penicillium* and *Aspergillus* were considerably more prevalent.

1765. Cason (Louise R.). **Fungus colony counts from air-borne spores in Birmingham, Alabama.**—*J. Allergy*, 26, 4, pp. 367–372, 1 graph, 1955.

Of 4,488 colonies of air-borne fungi developing on plates of Sabouraud's agar exposed thrice weekly for five minutes from 1st June, 1953, to 31st May, 1954, at Birmingham, Alabama, 964 (21·5 per cent.) were species of *Cladosporium*, 763 (17) of *Botrytis*, and 661 (14·7) of *Alternaria*; other genera occurring in percentages ranging from 2·7 to 6·9 comprised *Aspergillus*, *Epicoccum*, *Acrothecium*, *Stemphylium*, *Phoma*, and *Penicillium*. Peaks in the prevalence of *Alternaria* and *Cladosporium* were reached during June to July and September to October, while showers of *Phoma* were associated with a strong south wind on 30th April and of *Botrytis* with rainy days and south winds in December, January, and March.

1766. Castrecho Alvarez (J.) & Fernandez Castro (J.). **Numbers and kinds of air-borne, culturable fungus spores in Havana, Cuba.**—*J. Allergy*, 26, 2, pp. 150–152, 1 graph, 1955.

Of 5,535 mould colonies developing on plates of Sabouraud's agar at pH 5·6 exposed daily for a year at Havana, Cuba, 4,285 (roughly 80 per cent.) were identified. *Hormodendrum* and *Aspergillus* spp. and [unspecified] yeasts were the most prevalent (30·2, 19·2, and 16·2 per cent., respectively), while a number of other genera were encountered occasionally. The spores were most abundant from October to February and for a short period in April and May. An analysis of the seasonal fluctuations in 1,200 cases of rhinitis and asthma revealed deterioration during the winter in 69 per cent., 7 per cent. were more severe in the summer, and 24 per cent. were unaffected by changes in the weather.

1767. Collins-Williams (C.) & Best (C. A.). **Atmospheric mold counts in Toronto, Canada.**—*J. Allergy*, 26, 5, pp. 468–470, 2 graphs, 1955.

Daily mould counts, made both on exposed slides coated with 75 per cent. petroleum jelly and 25 per cent. mineral oil and on Petri dishes containing a modified Mehrlick's medium, during the period from 7th December, 1953, to 6th December, 1954, are reported from the Hospital for Sick Children, Toronto. The most important numerically were *Alternaria*, *Hormodendrum*, and [unspecified] yeasts (to which positive skin reactions are very common), the peak season extending from mid-July to mid-October. [Unidentified] smuts were prominent during the summer. Many persons also react positively to *Aspergillus fumigatus*, *Monilia* [*Candida*] *albicans*, and *Penicillium notatum*. In

the application of Wood's light (an essential in diagnosis) a stroblite black tube lamp is considered to be preferable to the purple X bulb.

1768. Van der Werff (P. J.). **Fungi in factories and workshops.**—*Acta allergol.*, 9, 2, pp. 107–124, 1956.

This is a useful survey of 46 contributions to the literature on the fungal populations of factories and workshops, with a critical discussion based on experience at the Amsterdam Clinic of Allergic Diseases.

1769. Gandy (D. G.). **Stysanus stemonites in mushroom houses.**—*MGA Bull., 1955*, 64, pp. 551–552, 2 figs., 1955.

Spores of *Stysanus stemonites*, growing on the compost straw and damp bed boards of a mushroom farm in Kent, England, caused distress to workers, and respirators had to be used. The symptoms, which included shivering, loss of appetite, inflammation of the nose and throat, and congestion of the lungs, developed at first only after day-long exposure, but later a reaction occurred in a few minutes. In severe cases there was persistent nose bleeding.

1770. Hyde (H. A.), Richards (M.), & Williams (D. A.). **Allergy to mould spores in Britain.**—*Brit. med. J., 21 April, 1956*, p. 886, 1 graph, 1956.

In preliminary studies spores were trapped on exposed plates at Cardiff and seven widely separated substations in Great Britain. Ninety-six per cent. of the 16,000 colonies determined, excepting sterile colonies, belonged to only eleven genera:—*Cladosporium* (*Hormodendrum*) 37·8 per cent.; *Pullularia* 10·4; *Penicillium* 9·1; *Epicoccum* 3·4; *Phoma* 3·0; *Aspergillus* 2·9; *Botrytis* 2·7; *Oospora* 2·6; *Sporotrichum* 2·1; and *Alternaria* 1 (plus a further possible 1·3 represented by dark but non-sporing colonies). There was more or less marked seasonal variation in the incidence of most of these fungi, *Cladosporium*, *Pullularia*, *Epicoccum*, *Botrytis*, *Alternaria*, and *Candida* having a summer predominance, while *Aspergillus* and *Oospora* were more common in winter. The pattern of incidence at Cardiff was essentially similar to that at the substations, except that *Cladosporium* was more abundant in the rural areas (70 to 80 per cent. as compared with 40 per cent.), while *Penicillium* was more abundant in the large towns.

It was concluded that the fungi listed were the only ones likely to cause asthma by inhalation out of doors. In another experiment far fewer spores were trapped in the still air of an undisturbed bedroom than in the open air [2, No. 960 and cf. Nos. 473, 474]. Following these studies, asthma cases at a Cardiff clinic were skin-tested with extracts of cultures of the fungi, reactions being counted positive only after confirmation by at least one further test. Mould sensitivity was found to be characterized by seasonal asthma with little or no conjunctivitis or rhinitis.

Of 627 patients skin-tested for *Cladosporium* 52 (8·3 per cent.) gave repeated positive reactions, and 26 were finally adjudged to be sensitive. For *Alternaria* and *Botrytis* the corresponding figures were 638, 13 (2 per cent.), 6, and 325, 7 (2·2 per cent.), 1, respectively. Positive reactions were also obtained for *Penicillium* (1 case out of 125), *Aspergillus* (6 out of 111), *Pullularia* (10 out of 128), *Phoma* (4 out of 93), and *Candida* (5 out of 56). None of these cases, however, could be definitely adjudged as clinically sensitive.

It was concluded that allergy to mould spores accounted for some 5 per cent. of all asthma cases and may play a subsidiary part in many more. As a result of these studies a large measure of success was achieved in the treatment [unspecified] of a number of cases which were previously not understood.

1771. Browning (W. H.). **Fungi and bacteria in the etiology of respiratory allergic disease. XVI. Further studies of the No. 33 extraction process : a comparative study of several dust extracts.**—*Ann. Allergy*, 14, 1, pp. 8–14, 1956.

A comparative study of two dust extracts prepared by the No. 33 technique [1, No. 1333 and next entry] and three available commercially was made by a group of investigators in many different parts of the United States, who tested 82 clinically sensitive subjects by the punch or scratch method. The extracts prepared by the No. 33 procedure proved to be definitely superior to the commercial ones.

1772. Prince (H. E.), Kaplan (M. A.), & Morrow (Marie B.). **Fungi and bacteria in the etiology of respiratory allergic diseases. XVII. Comparison of the allergenicity of a sporulating and a non-sporulating Alternaria.**—*Ann. Allergy*, 14, 1, pp. 15–17, 1956.

The results of intracutaneous tests at the Plant Research Institute, University of Texas, on 32 sensitive patients clearly demonstrated that extracts prepared by the No. 33 technique [see preceding entry] from a non-sporulating mycelium of *Alternaria tenuis* are allergenic. In the absence of a strictly quantitative procedure the total amount of major antigen from this source, as compared with extracts from a sporulating mycelium, could not be estimated, but no constant differences in the reactivity of the two forms were revealed by either the punch (scratch) or intradermal titration tests.

1773. Dutton (L. O.). **Fungi and bacteria in the etiology of respiratory allergic diseases. XVIII. Air-borne soil bacterial allergy.**—*Ann. Allergy*, 14, 1, pp. 18–20, 1956.

In three widely divergent cases of allergic disease at El Paso, Texas, the writer obtained promising results by treatment with an antigen of air-borne bacteria, using methods similar to those employed in comparable studies on moulds [see preceding abstracts].

1774. Morrow (Marie B.), Meyer (G. H.), Dutton (L. O.), & Prince (H. E.). **Fungi and bacteria in the etiology of respiratory allergic diseases. XIX. Bacteria, actinomycetes, and yeasts : atmospheric studies including a dust storm.**—*Ann. Allergy*, 14, 1, pp. 21–29, 1956.

A tabulated survey is presented of the incidence of micro-organisms in relation to allergy [1, No. 1844 and preceding entries] at the University of Texas on specific dates in August and November 1953; January, February, May, September, November, and December 1954; and March 1955. Actinomycetes (*Streptomyces* and *Nocardia* spp.) were trapped on all the sampling dates. The true yeast counts were low, *Cryptococcus* being more prevalent than *Sporobolomyces* or *Rhodotorula* spp. *Ustilago* was recovered only in the spring. The high incidence of *Pullularia* [*pullulans*] in a relatively dry atmosphere may indicate survival of the species under adverse climatic conditions.

Streptomyces spp. will grow on carbohydrate media, but a greater diversity of types, especially the grey-spored, appears on plain nutrient agar; a temperature of 37° C. favours their development. *Nocardia* spp. grow exclusively on plain nutrient agar both at 37° and 25°. Carbohydrate media seemed to be the most suitable for the true yeasts, though growth did occur on plain nutrient, mostly at 25°. The higher temperature promoted the development of *U.* sp., while *P. pullulans* grew only at 37°, chiefly on carbohydrate media.

1775. Samsøe-Jensen (T.). **Mould allergy sensitization by special exposure illustrated by two cases of allergy to Cladosporium fulvum.**—*Acta allergol.*, 9, 1, pp. 38–44, 1956.

Two cases are reported from Copenhagen, Denmark, of allergy to *Cladosporium fulvum*, of which there is stated to be only one previous record in Europe (*Nord. Med.*, 26, p. 1219, 1945). Both were females, aged 42 and 52, who developed symptoms only on exposure to the mould on tomatoes in greenhouses. It was indicated by means of the Prausnitz-Küstner passive transfer test that the fungus is the carrier of a species-specific antigen.

1776. Samsøe-Jensen (T.). **Culture of fungi on solid medium. Production of dry preparations for testing.**—*Acta allergol.*, 9, 1, pp. 34–37, 1956.

A simple method is described for the production of spore preparations of allergenic moulds for test and treatment purposes by culture on 10 per cent. malt extract agar in Petri dishes. The standard set of species used for scratch tests at the Clinic for Allergic Diseases in Children, Copenhagen, Denmark, consists of *Alternaria tenuis*, *Aspergillus glaucus*, *A. fumigatus*, *Cladosporium herbarum*, '*Penicillium glaucum*', *Pullularia pullulans*, *Monilia* [*Neurospora*] *sitophila*, and *Mucor racemosus*, all trapped in the outdoor air of the city (*Acta allergol.*, 3, p. 49, 1950).

1777. Sternberger (L. A.), Feinberg (A. R.), Feinberg (S. M.), Clarke (Martha), Benaim (C.), & Warren (S. A.). **Immunologic and clinical studies on allergenic fungi.**—*J. Allergy*, 27, 1, pp. 16–26, 2 figs., 2 diags., 1 graph, 1956.

At the North Western University Medical School, Chicago, a dialysable and a non-dialysable principle were obtained from *Alternaria* sp. (the most prevalent agent of mould allergy) [see above, No. 1767] grown on a modified Steinberg-Thorne medium with sucrose and nitrate as the sole sources of carbon and nitrogen, respectively. The antigen in the non-dialysable fraction was purified by deproteinization, precipitation as the uranyl salt, and low-temperature centrifugal ultra-filtration. This fraction induced positive reactions in cutaneous tests on allergic individuals and was precipitated with rabbit antiserum. The dialysable fraction also induced a positive response to skin tests. It did not precipitate with antiserum but acted as a hapten in specifically inhibiting precipitation of the non-dialysable principle.

1778. White (M. L.) & Owen (E. T.). **The surgical treatment of pulmonary blastomycosis.**—*Amer. Surg.*, 20, 9, pp. 981–995, 1954.

Four cases, observed from March, 1951 to April, 1953, in which unsuspected blastomycosis [*Blastomyces dermatitidis*] was diagnosed following the examination of resected lung material, bring the total of published cases of resection for this disease to 17 [cf. 2, Nos. 1203, 1488, 1785].

Certain features of blastomycosis and its treatment, requiring positive preoperative diagnosis and the selection of treatment analogous to that for pulmonary tuberculosis, are reviewed. The authors suggest that pulmonary blastomycosis should be treated medically with the new anti-fungal, chemotherapeutic drugs, reserving resectional surgery for the residual foci of irreversible pulmonary damage.

1779. MacMillan (H.). **Report on a case of localized blastomycosis.**—*Aust. J. Derm.*, 3, 1, pp. 38–41, 2 figs., 1955.

The clinical course of a blastomycosis (*Blastomyces dermatitidis*) originating on the eyelids and successively involving the nostrils, mouth, and scalp of an 18-year-old girl at Perth, Western Australia, is described. The condition

persisted for about three years, its treatment being complicated by the patient's intolerance of the oral administration of iodide, which was eventually overcome by a course of intravenous injections, apparently resulting in desensitization to the drugs. This is believed to be the first report of localized blastomycosis in Australia.

1780. Harrell (E. R.), Bocobo (F. C.), & Curtis (A. C.). **A study of North American blastomycosis and its treatment with stilbamidine and 2-hydroxystilbamidine.**—*Ann. intern. Med.*, 43, 5, pp. 1076–1091, 2 figs., 1955.

From the University Hospital, University of Michigan Medical School, and the Veterans' Administration Hospital, Ann Arbor, Michigan, detailed reports are given of the course of six cases of North American blastomycosis (*Blastomyces dermatitidis*) treated with stilbamidine and 2-hydroxystilbamidine [cf. 2, No. 1496]. It is considered that all six cases were primary pulmonary infections with secondary skin lesions, though attempts to demonstrate the pulmonary focus in two of the patients were unsuccessful. One unusual case of true mucous membrane involvement is included. Two patients were apparently cured after stilbamidine therapy; one may be cured, and others still have the active disease. Blastomycin skin tests were negative in five of the six cases, and significant complement-fixation titres were obtained in three of the relapsed patients. It is suggested that the immunologic status [cf. next entry] may play a very significant role in the cure of the disease by stilbamidine therapy. More improvement was noted in those patients receiving larger doses of the drugs, and this might possibly be explained by *in vitro* evidence of increased resistance of *B. dermatitidis* to stilbamidine. No correlation could be made between fifth nerve involvement and the total dosage of the drug.

1781. Takaro (T.), Hopkins (J. E.), & Murphy (J. D.). **The treatment of pulmonary blastomycosis.**—*Dis. Chest*, 28, 2, pp. 203–216, 1955. [Spanish and French summaries.]

This is a survey and critical discussion of current methods of therapy for pulmonary blastomycosis (*Blastomyces dermatitidis*) based on personal experience of 13 cases at the Veterans' Administration Hospital, Oteen, North Carolina, and a study of 33 contributions to the relevant literature. It is concluded that no entirely satisfactory form of treatment has yet been discovered, though hopeful prospects are offered by pulmonary resection for localized, stable lesions after immunological balance [cf. preceding entry] is secured, and by the administration of undecylenic acid orally [2, No. 53] and stilbamidine intravenously. A combination of the former and one of the diamidines may be the best mode of drug treatment available.

1782. Cherniss (E. I.) & Waisbren (B. A.). **North American blastomycosis : a clinical study of 40 cases.**—*Ann. intern. Med.*, 44, 1, pp. 105–120, 1956.

Forty cases of North American blastomycosis (*Blastomyces dermatitidis*), inpatients at Milwaukee County General Hospital, Milwaukee, Wisconsin, between 1910 and 1954, are described briefly. Of these, 36 had systemic involvement, the lungs being infected in 28. In the remaining four patients the disease was apparently confined to the skin. Data as to age, sex, race, residence, season of onset and occupation failed to reveal any significant clue as to the reservoir or pathogenesis of the disease, but support was obtained for the impression that the lungs are usually the portal of entry. Respiratory symptoms, however, gave rise to the complaint in only six cases, which implies that they may often pass unnoticed or be wrongly treated some long time before the incidence of the very varied presenting symptoms. Analysis of the

40 cases reveals that a combination of methods, including smears, cultures, biopsies, and skin tests, is necessary in the diagnosis of the disease, no one method proving infallible. Stilbamidine therapy was used in three cases but was apparently successful in only one. Iodides used to the exclusion of other treatments were entirely unsuccessful, but when combined with radiation therapy, surgery, and desensitization, they effected cures in seven out of 19 cases. In this series, all patients who survived four years from the onset of the disease were alive and well ten years after its onset: of those who died after ten years, only one succumbed to blastomycosis. These figures should be considered in evaluating therapeutic results of new drugs.

1783. Abraham (A.) & Luddecke (H. F.). **North American blastomycosis and bronchial carcinoma.**—*Dis. Chest.*, 28, 6, pp. 687–689, 1955. [Spanish and French summaries.]

An unusual case of blastomycosis (*Blastomyces dermatitidis*) associated with bronchogenic carcinoma in a 70-year-old coloured male is reported from the Morristown (New Jersey) Memorial Hospital, where 248 autopsies performed during the years 1952–3 revealed only two other instances of pulmonary mycosis, namely, one of aspergillosis [*Aspergillus* sp.] and one of cryptococcosis [*Cryptococcus neoformans*]. The fungal infection appeared to respond favourably to aureomycin therapy, and the patient's sudden death during bronchoscopy is tentatively attributed to exhaustion of the adrenal cortices under the stress of chronic illness.

1784. Giroux (M.) & Dessureault (R.). **Blastomycose généralisée.** [Generalized blastomycosis.]—*Laval méd.*, 20, 10, pp. 1326–1332, 1955.

The clinical and autopsy findings in a fatal case of generalized blastomycosis (*Blastomyces dermatitidis*) in a 52-year-old shipyard worker are reported from the Hôpital Laval, Quebec [2, Nos. 1204–1206].

1785. Smith (S. G.), Harris (J. S.), Conant (N. F.), & Smith (D. T.). **An epidemic of North American blastomycosis.**—*J. Amer. med. Ass.*, 158, 8, pp. 641–646, 2 figs., 1955.

This is a report from the Duke University School of Medicine, Durham, North Carolina, on ten cases of blastomycosis (*Blastomyces dermatitidis*) occurring between October, 1953 and March, 1954. *B. dermatitidis* was cultivated from sputum or gastric washings of the nine non-fatal cases and from material from the lung abscess of a baby who died. In an addendum a further case from the town is mentioned, in which the diagnosis was made on material from a lobectomy [2, No. 1778]. This patient and one other recovered spontaneously, while the remainder responded rapidly to treatment with stilbamidine or 2-hydroxystilbamidine [cf. 2, Nos. 1496, 1780].

1786. Schnapka (O.). **Onychomycosis nigricans. Beitrag zum Krankheitsbild der 'schwarzen Nägel'.** [Onychomycosis nigricans. Contribution to the pathological picture of 'black nails'.]—*Arch. klin. exp. Derm.* (formerly *Arch. Derm., Wien*), 202, 1, pp. 45–50, 8 figs., 1956.

From the University Skin Clinic, Tübingen, Germany, a case of 'black nails' is reported, involving the second, third, and fourth fingers of the left hand and the right index finger in a 56-year-old female medical missionary from the Gold Coast, the first symptoms having appeared in 1943. Cultures of scrapings on Sabouraud's maltose agar plus neomycin yielded *Blastomyces dermatitidis* and *Alternaria tenuis*, and it is postulated that the alterations arose from the symbiosis of the two species. The designation of 'onychomycosis nigricans' is proposed to describe the complaint.

1787. Halliday (W. J.) & McCoy (Elizabeth). **Biotin as a growth requirement for Blastomyces dermatitidis.**—*J. Bact.*, 70, 4, pp. 464–468, 1 graph, 1955. [Received April 1956.]

Of six strains of *Blastomyces dermatitidis* examined in a synthetic medium in the Department of Bacteriology, University of Wisconsin, all required biotin for growth, the degree of growth being proportional to the concentration supplied. A strain recently isolated required only 0·04 μg. per ml. for maximum growth, and an old laboratory culture 0·1 μg. per ml. The only substance able to replace biotin was DL-desthiobiotin, which was only half as active.

1788. Weed (L. A.). **North American blastomycosis.**—*Amer. J. clin. Path.*, 25, 1, pp. 37–45, 6 figs., 1955.

From the Mayo Clinic, Rochester, Minnesota, the author describes the morphological and cultural characteristics of *Blastomyces dermatitidis*, the cause of North American blastomycosis. The epidemiology, clinical findings, and histology of the disease are summarized, particular attention being paid to pitfalls in diagnosis.

1789. Földvari (F.) & Florian (E.). **Erfahrungen bei 15 Fällen von Blastomykose.** [Observations in 15 cases of blastomycosis.]—*Hautarzt*, 6, 7, pp. 294–300, 4 figs., 1955.

From the Dermatological Clinic of the University of Budapest, Hungary, the authors report in detail on 15 cases of blastomycosis, three of the Gilchrist type and the rest of the Busse-Buschke, attributed to *Blastomyces dermatitidis* and *Cryptococcus hominis* [*C. neoformans*], respectively. The organisms actually isolated were a *Schizosaccharomyces* from one patient and strains of *Cryptococcus* in five cases, in another five fungal elements were demonstrated by pathohistological methods, while in the remaining four the symptoms were characteristic and the blastomycin skin test gave positive results. There were two other positive reactors to blastomycin, five to autovaccine, and three to polyvalent vaccine. The duration of the illness ranged from seven months to 32 years. One patient succumbed after 26 years, but all the others recovered more or less completely under appropriate treatment, including injections of penicillin or syntestrim and the administration of sulphamide, potassium iodide, and other medicaments, singly or combined, and X-ray irradiation.

1790. Littman (M. L.) & Zimmerman (L. E.). **Cryptococcosis-Torulosis.**—x+205 pp., 196 figs. (33 col.), New York & London, Grune & Stratton, Inc., 1956. $8.50.

This is a comprehensive review of the accumulated scientific and medical data on the following aspects of human and animal cryptococcosis (*Cryptococcus neoformans*): disseminated nature of the disease; symptomatology of pulmonary, osseous, and cerebral cryptococcosis, involvement of the skin, mucous membranes, bones, and joints; relation to lymphoma, leucaemia, and sarcoidosis; differential diagnosis; source of the organism, relation to the soil, incidence, and mode of transmission; serology in diagnosis, antigenicity, and skin hypersensitivity, description of the disease in animals, and cryptococcal mastitis in dairy herds; pathological response in human tissues, reaction in the lungs, liver, spleen, nervous system, mucous membranes, bones and joints, eye, and other organs; review of the treatment of the disease in its localized and disseminated forms, prognosis; biology and biochemical activity of *C. neoformans* and biological classification; antimycotic agents derived from higher plants, bacteria, actinomycetes, and fungi, synthetic antimycotics; and diagnosis by cultural and histologic methods, pathogenicity for experimental animals.

The monograph is supplemented by an appendix of 19 culture formulae and tissue-staining techniques and a list of 504 references to the relevant literature.

1791. Goodman (H. L.). **Cryptococcosis associated with Hodgkin's disease.**—*N.Y. St. J. Med.*, 56, 9, pp. 1493–1497, 3 figs., 1956.

A case of combined cryptococcosis (*Cryptococcus neoformans*) and Hodgkin's disease [2, Nos. 1503, 1792] in a 57-year-old man is fully reported, with autopsy findings, from the Veterans' Administration Hospital, Brooklyn, New York. Diagnosis was made by spinal fluid culture in brain-heart infusion broth and blood agar during the patient's lifetime. This is stated to be the 18th recorded case of the association of the two diseases. The inadequacy of current methods of therapy is emphasized.

1792. Zimmerman (L. E.) & Rappaport (H.). **Occurrence of cryptococcosis in patients with malignant disease of reticuloendothelial system.**—*Amer. J. clin. Path.*, 24, 9, pp. 1050–1072, 5 figs., 1954.

Sixty cases of cryptococcosis (*Cryptococcus neoformans*) collected at the Armed Forces Institute of Pathology, Washington, D.C., were studied. The organism was examined in tissue sections of all cases by haematoxylin and eosin, periodic acid-Schiff, and mucicarmine stains. In 21 cases the organism had been identified culturally. The cases were divided into four groups:—(1) disseminated (24 cases), (2) pulmonary and meningo-encephalitic (9 cases), (3) meningo-encephalitic only (14 cases), and (4) localized (13 cases). Malignant reticuloses were found in 18 cases, of which 15 were in group 1 and none were in group 4. Hodgkin's disease [2, Nos. 1791, 1793] accounted for 11 cases. The malignant condition preceded the cryptococcal infection by months or years in all cases, and in only a third of the cases was there evidence that the fungus infection was present longer than the last month of life. One case showed cryptococci for 4½ months before death. In all cases where the two conditions co-existed, the cryptococcal infection was either directly responsible for death or was an important contributory factor. No evidence could be found that treatment of the malignant disease was in any way responsible for the infection. Speculations on the association of the two conditions are discussed and the literature on the subject is reviewed.

1793. Misch (K. A.). **Torulosis associated with Hodgkin's disease.**—*J. clin. Path.*, 8, 3, pp. 207–210, 4 figs., 1955.

A 41-year-old man was admitted to the Prince of Wales Hospital, London, with a three months' history of weakness and loss of energy. After three months remittent pyrexia, he developed a palpable spleen and enlarged glands in the groin, from one of which *Cryptococcus neoformans* was cultured. The patient died 13 months after the onset of symptoms, and the histological picture of Hodgkin's disease [cf. preceding and next entries] was seen in the liver, spleen, and lymph nodes. Cryptococcal infection was limited to the lymph glands of the right groin.

1794. Levene (M.) & Michaels (L.). **Acute disseminated torulosis associated with Hodgkin's disease.**—*J. clin. Path.*, 8, 3, pp. 201–206, 5 figs., 1955.

After admission to Crumpsall Hospital, Manchester, for treatment of ulcers of the legs, a woman of 59 developed signs of liver failure, and died after about four months in hospital. In the fourth and third days before her death, *Cryptococcus neoformans* was isolated from the ascitic fluid. Post mortem showed that the enlarged cirrhotic liver, the spleen, and lymph nodes were infiltrated with cells typical of Hodgkin's disease [cf. preceding entries].

Numerous cryptococci were found in the lungs within clusters of histiocytes. The fungus was also seen in the brain and in many other organs and tissues. It is suggested that there is some relationship between Hodgkin's disease and torulosis. The overwhelming terminal infection in the patient may be due to the large doses of antibiotics she had received.

1795. Susman (M. P.). **Torula (Cryptococcus) infection of the lung.**—*Aust. N.Z. J. Surg.*, 23, 4, pp. 296–299, 1954.

Three new cases of pulmonary torulosis (*Torula* (*Cryptococcus*) *histolytica*) [*C. neoformans*] are described from Australia [cf. 1, No. 484; 2, No. 35], two of them exhibiting meningeal involvement [cf. next entry]. Pulmonary resection is almost certainly indicated if the lesion is localized and provided that there is no meningitis, but its efficacy is questionable if the latter is present. Resections performed on one patient with pulmonary infection only and on one with both pulmonary and meningeal infection were both successful. The other patient with double infection died.

1796. Caldwell (D. C.) & Raphael (S. S.). **A case of cryptococcal meningitis.**—*J. clin. Path.*, 8, 1, pp. 32–37, 6 figs., 1955.

A 42-year-old carpenter with a six-weeks' history of pain in the neck and shoulders was found at the Southend General Hospital to have clinical evidence of meningitis. Lumbar puncture yielded fluid under increased pressure, containing 86 cells per cu. mm., of which 85 per cent. were lymphocytes. The chlorides were slightly below normal, and there was 150 mgs. of protein per 100 ml., with excess globulin. A paretic type of curve was observed with Lange's colloidal gold test, the Wassermann and Price precipitation reaction being negative. Further lumbar punctures gave similar results, but a fortnight after the patient was first seen, the cerebrospinal fluid contained only 14 mgs. of sugar per 100 ml. and budding cryptococci were observed in it. These organisms were obtained by culture of the fluid. The patient's condition deteriorated, and treatment with 'actidione' intravenously (720 mg.) and intrathecally (200 mg.) in 20 days did not affect his progress, death occurring six weeks after admission. *Cryptococcus neoformans* was isolated from the cerebrospinal fluid [cf. 2, Nos. 1504, 1795] throughout the illness. The fluid was shown to exert no inhibitory effect on cultures of the patient's organism and of a stock strain of *C. neoformans*, showing that, although the organism was sensitive to 'actidione', the C.S.F. level of the drug was inadequate. Mice inoculated with the patient's organism became infected, but not those inoculated with various materials with which he had worked.

1797. Baker (R. D.) & Haugen (R. K.). **Tissue changes and tissue diagnosis in cryptococcosis. A study of 26 cases.**—*Amer. J. clin. path.*, 25, 1, pp. 14–24, 12 figs., 1955.

Tissues from twenty-six cases of cryptococcosis (*Cryptococcus neoformans*) were examined at the Duke University School of Medicine, North Carolina. Sections were stained by haematoxylin and eosin, the periodic acid-Schiff reaction, Grindley's method, and MacCallum's modification of Gram's stain. Scrapings from the tissues were also examined. Eleven cases were examined culturally and ten yielded *C. neoformans*. The organism was abundant in nine cases and rare in three. The commonest cellular reaction consisted of lymphocytes and macrophages, polymorphs being less common. Giant cells were seen in 23 cases, usually with intracellular organisms. Fibrosis was present in about half the cases, but caseous necrosis was less common (five cases). In

four of the cases, reticuloses were present, and in all these there were abundant organisms, with miliary dissemination in two cases. In none of the cases were large pulmonary lesions, either cavities or gelatinous masses, seen.

1798. Haugen (R. K.) & Baker (R. D.). **The pulmonary lesions in cryptococcosis with special reference to subpleural nodules.**—*Amer. J. clin. Path.*, 24, 12, pp. 1381–1390, 7 figs., 1954.

Fifteen cases of cryptococcosis (*Cryptococcus neoformans*) from Duke University School of Medicine, North Carolina, were divided into five groups depending on the size and distribution of the lesions. Group I consisted of four cases in which small subpleural nodules were incidental post mortem findings in deaths due to other causes. Cryptococci were found only in the lungs. The pulmonary lesions in group II were similar, but cryptococci occurred elsewhere in the body. Both cases in this group had fatal cryptococcal infections of the central nervous system. In the three cases of group III the disease was confined to the lungs, but the lesions were large and required resection. Group IV, consisting of three cases, had miliary cryptococcal lesions of the lungs with other lesions elsewhere in the body. In group V are placed the three cases of cryptococcosis without pulmonary involvement, all of which were infections of the central nervous system. It is thought that the pulmonary lesions in groups I and II represented primary foci of infection. The lesions were less than 1·5 cm. in diameter and, as there was no lymphatic spread, the blood appears to bear the infection to the nervous system. Local development of the lesion (group III) may be symptomless, and the reason why no dissemination of the infection occurred is not understood.

The cases in group V in which fatal meningitis [cf. preceding entries] occurred without pulmonary lesions are thought to be those in which the infection has spread from a primary lesion in the lung which has then healed, so that no evidence of it is found at post mortem examination.

1799. Linhartová (Alena). **Mykose, wahrscheinlich Cryptococcose, um eine Gallengangfistel und Candidose im Peritonealabszeß.** [Mycosis, probably cryptococcosis, round a gall duct fistula, and candidosis in a peritoneal abscess.]—*Zbl. allg. Path. path. Anat.*, 94, 9–10, pp. 439–442, 1 fig., 1956.

A full account is given of the post-mortem findings at the Pathological Institute of the Karl University, Plzen, Czechoslovakia, in two cases of fungal infection, both in females, aged 54 and 57. In the former the organism in the granuloma near a gall duct fistula was in all probability identical with *Cryptococcus hominis* [*C. neoformans*], while a peritoneal abscess in the latter contained masses of pseudomycelia and blastospores of *Candida* [? *albicans*]. Both patients had received antibiotic therapy.

1800. Molnár (J.). **Über die dichroitische Färbung der Kapsel des Cryptococcus neoformans.** [On the dichroic staining of the capsule of *Cryptococcus neoformans*.]—*Schweiz. Z. allg. Path. Bakt.*, 19, 1, pp. 82–87, 8 figs., 1956. [French and English summaries.]

The mucoid capsule of *Cryptococcus neoformans* in the cerebral tissue of a case of meningo-encephalitis, the first reported instance of this disease in Hungary (*Orv. Hétil.*, 96, p. 685, 1955), exhibited slight double refringence which was greatly enhanced by application of the dichroic staining method, especially with 1 per cent. Bismarck brown and 1 per cent. acridin orange. The latter further enables the specimens to be examined under fluorescent light.

1801. T'UNG-EN (C.) & WEI-FANG (C.). **Torula meningitis : report of a case.**—*Chin. med. J.*, 74, 2, pp. 160–163, 1 fig., 1956. [Russian summary.]

A case of meningitis caused by *Cryptococcus neoformans* in a 40-year-old male, reported from the Municipal First People's Hospital, Changchow, is stated to be only the sixth record of the disease in China. The fungus was demonstrated by the culture of spinal fluid on Petroff's and Sabouraud's media.

1802. UZMAN (L. L.), ROSEN (H.), & FOLLEY (G. E.). **Studies on the biology of Cryptococcus. VI. Amino acid composition of the somatic proteins of Cryptococcus neoformans.**—*J. infect. Dis.*, 98, 2, pp. 208–210, 1956.

In further studies in the current series [2, No. 2411] the over-all amino acid composition of the somatic total proteins of a lightly and a heavily encapsulated strain of *Cryptococcus neoformans*, determined by quantitative ion exchange chromatography, proved to be similar. Both were distinguished by a high content of dicarboxylic amino acids and the absence of methionine.

1803. EMMONS (C. W.). **Saprophytic sources of Cryptococcus neoformans associated with the Pigeon (Columba livia).**—*Amer. J. Hyg.*, 62, 3, pp. 227–232, 1955.

In Loudoun County, Virginia, *Cryptococcus neoformans*, the etiological agent in some 10 per cent. of the 300 to 400 fatal mycosis reported annually in the United States (Vital Statistics of the United States, 2, p. 17, 1952), was isolated from 63 out of 111 specimens of pigeons' nests of the previous season and droppings from underneath roosting sites collected from 19 premises, of which 16 harboured infective material. The fungus has not yet been isolated from 20 pigeons from four of the farms yielding positive specimens, and the relationship appears to be an adventitious saprophytic occurrence in an appropriate medium.

The significance of these findings for medical and veterinary mycology is discussed. A diagnosis of cryptococcosis should be considered in outbreaks of pneumonitis among persons exposed to contact with pigeons' nests or dung.

1804. KÖNIGSBAUER (H.). **Experimenteller Beitrag zur Behandlung der Torulose mit D 25 (2,2′-Dioxy-5,5′-dichlordiphenylsulfid).** [Experimental contribution to the therapy of torulosis with D 25 (2,2′-dioxy-5,5′-dichlorodiphenylsulphide)] —*Zbl. Bakt.*, Abt. 1, 164, 6/7, pp. 466–471, 3 figs., 1955. [French and Russian summaries.]

In experiments on inbred albino rats [2, No. 1148] the symptoms of infection by *Torula histolytica* [*Cryptococcus neoformans*] were alleviated, but not suppressed, by a course of subcutaneous injections of D 25 [2, No. 1698] beginning on the day of inoculation. The results of treatments undertaken ten days later when the disease had already declared itself, were questionable. An investigation of the possibility of therapy with D 25 in torulosis of the nervous system gave negative results, since the compound is not demonstrable in the brain at an effective concentration.

1805. TAKOS (M. J.). **Experimental cryptococcosis produced by the ingestion of virulent organisms.**—*New Engl. J. Med.*, 254, 13, pp. 598–601, 2 figs., 1956.

At the George Hospital Laboratory, Ancon, Canal Zone, Panama, systemic cryptococcosis was induced in two out of three marmoset monkeys (*Leontocebus geoffroyi*) by the ingestion of yeasts from virulent cultures of *Cryptococcus neoformans* mixed with food. The organisms retained their pathogenicity to white rats after several weeks in the marmosets' intestines.

1806. Azulay (R. D.). **Zur Histopathologie der Chromoblastomycose.** [On the histopathology of chromoblastomycosis.]—*Hautarzt*, 6, 5, pp. 205–208, 7 figs., 1955.

The following conclusions regarding the histopathology of chromoblastomycosis (*Fonsecaea* [*Phialophora*] *pedrosoi* or *P. verrucosa*) are based on a study of human and animal tissue specimens at the Clinic for Dermatology of the University of Rio de Janeiro, Brazil [2, No. 1516]. On coming into contact with healthy tissue the fungus multiplies rapidly and evokes a simple inflammatory reaction in the form of micro-abscesses containing an abundance of brown, circular spores which become progressively fewer with the development of an immune-biological response in the host. At the same time a wall of histiocytes is built up round the abscesses. These changes may be concealed by cells giving rise to the formation of tuberculoid structures. At this stage few or no fungal elements are present. Thus, although the manifestations of the disease change with its duration and the intervention of immune-biological factors, the process itself is a unity and there is no reason to subdivide it into cutaneous and epidermo-cutaneous forms as proposed, e.g., by Tiberica in a thesis submitted to the Faculty of Medicine of the University of São Paulo, Brazil, in 1939.

1807. Vignale (B.), Montero (E. D.), Tost (J. F.), & Sanjines (A.). **Cromoblastomicosis (segundo caso descrito en el Uruguay).** [Chromoblastomycosis (second case described in Uruguay).]—*An. Fac. Med. Montevideo*, 40, 3–4, pp. 87–92, 6 figs., 1955. [English summary.]

A 65-year-old agricultural labourer presented a single pruritic, scaly, infiltrated patch, localized on the trunk, which yielded only mycelia with the *Hormodendrum* type of sporulation in Sabouraud's and maize meal agar cultures. He had contracted the infection 30 years earlier in the Canary Isles. Direct examination of the scales revealed groups of rounded, brown, thick-walled bodies and masses of mycelia with multiple smaller spores. This is the second case of chromoblastomycosis to be recorded in Uruguay, the first having been described by Mackinnon (*Arch. urug. Med.*, 5, p. 201, 1934).

1808. Peck (W. A.) & Romendick (S. S.). **Coccidioidomycosis. A roentgen study.** —*Tex. St. J. Med.*, 52, 1, pp. 86–93, 7 figs., 1956.

Seven cases of coccidioidomycosis (*Coccidioides immitis*) are briefly described from the William Beaumont Army Hospital, Fort Bliss, Texas, to illustrate this roentgenographic study of the disease [cf. 2, No. 1245]. In about 40 per cent. of the infected population active symptoms develop, nearly always accompanied by roentgenographic abnormalities. The appearance of the pulmonary coccidioidal infiltrates is not specific in itself, but associated regional adenopathy and multiple areas of pneumonitis should arouse suspicion.

1809. Tudbury (Patricia). **The electrocardiogram in primary coccidioidomycosis.** —*Calif. Med.*, 83, 2, pp. 89–90, 1 graph, 1955.

In 15 out of 20 unselected cases of early primary coccidioidomycosis [*Coccidioides immitis*] seen in private practice or at the Tulare County General Hospital, Pomona, California, the electrocardiogram remained essentially normal, but in the remaining five there were significant changes after recovery from the acute stage of the illness. Thus, previously inverted, flat or diphasic T waves became upright in four patients and low voltages increased in amplitude in two; in one case both changes were observed. This small series of cases comprised nine males and 11 females aged between four and 45, seven of

Mexican descent, one an American Indian, one a negro, and the rest of native white stock. Most of the adults were agricultural workers exposed to dust.

1810. Creitz (J. R.) & Puckett (T. F.). **A method for cultural identification of Coccidioides immitis.**—*Amer. J. clin. Path.*, 24, 11, pp. 1318–1323, 5 figs., 1954.

Coccidioides immitis was cultured at least once from each of 38 patients in three years at the Laboratory of Fitzsimons Army Hospital, Denver, Colorado. Isolations were made from pus, sputum, empyema fluid, tissues, or bronchial washings. Of the media used, brain-heart infusion agar was found to be the best. The characteristics of colonies of *C. immitis* are described. For identification purposes, as soon as the organism is suspected, the colony is picked into broth for mycelial growth, which is usually sufficient for inoculation into mice after a week's incubation. The mycelial mass is ground up using a pestle and mortar, and 1 ml. of suspension is inoculated into two or three mice, which are killed six days later. The peritoneal cavity is searched for granulomas, which are crushed between slides and examined for spherules. Sections of granuloma are cut and stained by the periodic acid-Schiff reaction. Serological examination of 25 of the 38 cases of coccidioidomycosis yielded diagnostic results in only five, and nine of the patients reacted negatively to coccidioidin skin tests.

1811. Smith (C. E.), Saito (Margaret T.), & Simons (Susan A.). **Pattern of 29,500 serologic tests in coccidioidomycosis.**—*J. Amer. med. Ass.*, 160, 7, pp. 546–552, 4 figs., 1956.

The authors describe the results of precipitin and complement-fixation tests on 18,500 serum samples from cases of coccidioidomycosis. Though specific precipitins appear in the blood at an early stage of infection they are transient and the precipitin test is of little value after the fifth month. The complement-fixing antibodies appear at a later date than the precipitins, and are an indication of progressive infection, but even in clinically manifested primary pulmonary coccioidomycosis the diagnosis in about one-third of the cases must rest entirely on the precipitin test. Precipitins are rarely found in disseminated infections, and are almost unknown in coccidioidal pulmonary residuals, with or without cavitation.

Complement-fixing antibodies usually appear during the first three months, the titre being in general a measure of the severity of infection. Titres in excess of one in 16, or one in 32, indicate probable dissemination of infection. The presence of antibodies in the cerebro-spinal fluid is an indication of coccidioidal meningitis. Antibodies may pass across the placenta into the foetal circulation, but congenital coccidioidomycosis is not known to occur.

1812. Converse (J. L.). **Growth of spherules of Coccidioides immitis in a chemically defined liquid medium.**—*Proc. Soc. exp. Biol., N.Y.*, 90, 3, pp. 709–711, 2 figs., 1955.

The medium used for the growth of the parasitic (spherule) phase of *Coccidioides immitis* [2, Nos. 997, 1525] at Camp Detrick, Frederick, Maryland, was a modification of the one devised by Roessler *et al.* [1, Nos. 713, 714] with the addition of 4 p.p.m. zinc sulphate. Spherules measuring 3 to 80 μ in diameter appeared after 72 hours' incubation at 34° C. and production reached a maximum between 96 and 120 hours. They originated at terminal and intercalary sites on the hyphae from chains of arthrospores, 3 to 5 μ in diameter, and contained endospores 1 to 5 μ in diameter. The parasitic form appeared to comprise 50 per cent. or more of the total growth of the cultures.

The strain of *C. immitis* (M 11) used in most of the studies was isolated from

a rodent in Arizona, but 38 others of human and animal origin were also tested under identical conditions, of which 60 per cent. developed spherules, though not so profusely as M 11.

1813. Breslau (A. M.). **Comparative histochemical studies on Coccidioides immitis and Haplosporangium parvum.**—*J. Histol. Cytol.*, 3, 2, pp. 141–147, 12 figs., 1955.

A study at the Veterans' Administration Centre, Los Angeles, California, demonstrated that the most marked histochemical differences between the parasitic phases of *Coccidioides immitis* and *Haplosporangium parvum* lay in the structure of the walls of the spherules. In the latter they are composed of cellulose lying in a protein matrix relatively free from phospholipid, while in the former they are composed of chitin lying in a protein matrix and surrounded by phospholipid. These differences indicate that the two fungi are taxonomically unrelated and provide a means of identifying them at any stage of development in the host tissue.

1814. Friedman (Lorraine), Smith (C. E.), & Gordon (L. E.). **The assay of virulence of Coccidioides in White Mice.**—*J. infect. Dis.*, 97, 3, pp. 311–316, 4 graphs, 1955.

At the Naval Biological Laboratory, University of California, Berkeley, the virulence of three strains of *Coccidioides immitis* [2, Nos. 508, 1815] was differentiated in white mice by the intraperitoneal inoculation of 100 viable particles, the host responses being measured by plotting the daily cumulative percentage of animals dead during a 90-day observation period. Variations in virulence were indicated by markedly divergent mortality curves. The same lethal relationships were expressed by two other indices: (1) length of time (in days) when 50 per cent. of the animals were dead (LT 50) and (2) percentage dead at 30 days. Estimations of median lethal dosages confirmed the same strain relationships for fixed dimensions of time. In measurements of virulence the time of observation must include the period of most rapid dying. It is further pointed out that unduly large dosages accelerate the death-rate to such an extent as to preclude discrimination between strains.

The age and sex of the mice exerted no perceptible influence on mortality, which was, however, much higher in the Namru strain (*J. Hered.*, 61, pp. 122–124, 1950) used in the bulk of the experiments than in animals procured from a commercial source.

1815. Pappagianis (D.), Smith (C. E.), & Kobayashi (G. S.). **Relationships of the in vivo form of Coccidioides immitis to virulence.**—*J. infect. Dis.*, 98, 3, pp. 312–319, 3 figs., 2 graphs, 1956.

In this joint report from the Naval Biological Laboratory and the School of Public Health, University of California, Berkeley, intraperitoneal inoculation experiments on mice [cf. preceding entry] are described in which two strains of *Coccidioides immitis*, differing markedly in virulence in the arthrospore stage, were shown to behave similarly in the endospore (*in vivo*) form [cf. 2, No. 992]. The endospores appeared to be very active metabolically, germinating some 10 hours before the arthrospores under comparable aerobic conditions.

1816. Singh (H.), Yast (C. J.), & Gladney (J. H.). **Coccidioidomycosis with laryngeal involvement.**—*Arch. Otolaryng., Chicago*, 63, 3, pp. 244–247, 5 figs., 1956.

The authors describe a case of chronic, disseminated, granulomatous-type coccidioidomycosis (*Coccidioides immitis*) involving the skin and larynx of a

34-year-old male negro at the Veterans' Administration Hospital, Hines, Illinois, this being apparently the first published report of infection of the endolarynx. A mild clinical improvement followed the intravenous injection of dihydroxystilbamidine.

1817. Hoffman (C. L.) and Doerner (A. A.). **Disseminated coccidioidomycosis. Combined estrogen-androgen-trypsin therapy.**—*Calif. Med.*, 84, 1, pp. 54–55, 1956.

From the United States Public Health Service Hospital, San Francisco, the authors report the apparently complete cure of disseminated coccidioidomycosis [*Coccidioides immitis*], following an injury to the right knee of a 46-year-old Filipino-American shipyard worker, by a combination of oestrogen, androgen, and trypsin therapy.

1818. Bain (G. O.), Carmichael (J. W.), & Elliott (J. F.). **Residual pulmonary coccidioidal granuloma.**—*Canad. med. Ass. J.*, 75, 3, pp. 216–218, 3 figs., 1956.

From the University of Alberta Hospital, Edmonton, the authors report a case in 1955 of a single discrete ('coin') chest lesion in a 35-year-old farmer, which was diagnosed by a simple alkali digestion and concentration technique as a residual coccidioidal granuloma (*Coccidioides immitis*) [2, No. 993]. The patient had worked for a year in 1951–2 in Arizona, where 'valley fever' was prevalent, though he himself had not suffered from it. Thoracotomy was performed and the lesion removed by wedge excision.

1819. Levy (L. J.), Lipscomb (C. P.), & McDonald (H. C.). **Coccidioidomycosis of bone.**—*Tex. St. J. Med.*, 52, 1, pp. 27–31, 5 figs., 1956.

A case of coccidioidal granuloma (*Coccidioides immitis*) of 12 years' duration involving the left knee of a 45-year-old male patient is reported from the Fort Worth (Texas) Bone and Joint Clinic [cf. 2, No. 991]. A favourable response to surgical excision of the lesions was obtained.

1820. Cohen (R.). **Unusual coccidioidomycosis cases.**—*Arch. Pediat.*, 72, 8, pp. 275–282, 4 figs., 1955.

Four unusual cases (two fatal) of coccidioidomycosis (*Coccidioides immitis*) in children are reported from the Kern General Hospital, Bakersfield, California. Methods of therapy, including the administration of cinnamic acid and oil of sassafras, are outlined. It is concluded that the majority of osseous lesions caused by the fungus are not self-limiting, as contended by Dykes *et al.* [2, No. 297].

1821. Van Staveren (C.). **Een geval van coccidioidomycosis.** [A case of coccidioidomycosis.]—*Ned. Tijdschr. Geneesk.*, 100 (i), 10, pp. 706–708, 1 pl., 1956. [English summary.]

In November, 1954, a shadow in the left lung of a 39-year-old man was revealed by radiography. During the previous spring he had travelled through the southern United States and contracted an illness then believed to be influenza, which responded to penicillin therapy. In view of the possibility of tubercular infection or a peripheral carcinoma, an operation was performed in September 1955, at the Coolsingel Hospital, Rotterdam, which disclosed a granuloma caused by *Coccidioides immitis*, not hitherto recorded in Holland. The patient's recovery was interrupted by an attack of infectious mononucleosis, which was successfully treated with aureomycin, and eventually his health was fully restored.

1822. Egeberg (R. O.) & Ely (A. F.). **Coccidioides immitis in the soil of the Southern San Joaquin Valley.**—*Amer. J. med. Sci.*, 231, 2, pp. 151–154, 1956.

Coccidioides immitis was present in 35 out of 500 soil samples collected between Buttonwillow and McKittrick in the San Joaquin Valley, California. The samples were examined by plating out 0·5 ml. portions of soil suspensions of various strengths on 'Sabouraud's fortified medium'. Colonies were sub-cultured and inoculated into mice to obtain conclusive proof of identity.

The fungus was more prevalent in animal burrows than elsewhere (24 positive out of 177 burrow samples, compared with 11 positive out of 323 random samples). In January there was no significant difference between findings at the surface and at four, eight, and twelve inches below the surface in the random samples (six positive out of 243), but in April the positive results (five out of 20 samples) were all from the surface. This difference seems to be associated with the humidity of the soil, but is not easy to understand.

1823. Cohen (R.) & O'Connor (R.). **A new fungicide for Coccidioides immitis.**—*Arch. Pediat.*, 72, 5, pp. 154–155, 1955.

In experiments *in vitro* at the Kern General Hospital, Bakersfield, California, a nitrofuran derivative, 5-nitro-2-furfuryl-3-chloropropionate, inhibited the growth of *Coccidioides immitis* on Sabouraud's agar at a concentration of 11 μg. per ml.

1824. Reed (R. E.). **Diagnosis of disseminated canine coccidioidomycosis.**—*J. Amer. vet. med. Ass.*, 128, 4, pp. 196–201, 2 figs., 1956.

The results of a study of 52 cases of canine coccidioidomycosis (*Coccidioides immitis*) [2, No. 1249] (26 in boxers) are reported from the Department of Animal Pathology, Arizona Agricultural Experiment Station. Infection appears to be almost invariably chronic, a two- to five-month course being typical, and the ages of the affected dogs ranged from six weeks to six years.

1824*a*. Silverman (F. N.), Schwarz (J.), Lahey (M. E.), & Carson (R. P.). **Histoplasmosis.**—*Amer. J. Med.*, 19, 3, pp. 410–459, 36 figs., 2 graphs, 1955.

This important, fully documented joint contribution to the knowledge of *Histoplasma capsulatum* from the Children's, General, and Jewish Hospitals, Cincinnati, Ohio, and the University of Cincinnati College of Medicine, supplemented by a list of 216 references, is described as an attempt to sift and organize the available information concerning histoplasmosis, to evaluate still existent problems, and to report seven new proved cases illustrating the variability of the clinical picture. The findings are presented under the headings of history and epidemiology, geographic distribution, histoplasmosis in animals, serology, mycology, histoplasmin, pathology, histoplasmosis and lymphoma, haematology, sex incidence, clinical features, radiologic features, diagnosis, treatment, and case reports. The ages of the patients ranged from two to 69 years and four succumbed to the illness.

1825. Schwarz (J.). **Some important features of histoplasmosis.**—*Amer. Practit.*, 7, 2, pp. 258–262, 4 figs., 1 graph, 1 map, 1956.

Histoplasmosis (*Histoplasma capsulatum*) is stated to occupy an increasingly important place among acute and chronic infectious diseases in the United States, especially in the Mississippi Valley. The majority of cases are asymptomatic, benign, and localized, but in a small percentage the infection may become systemic, assuming an acute or chronic form. The diagnosis may be suspected from complement fixation with rising titre but should be confirmed by demonstration of the fungus in the tissues or other biopsy specimens,

supplemented if necessary by isolation in pure culture. There is no reliable specific treatment available at present.

1826. Peterson (J. C.) & Christie (A.). **Histoplasmosis.**—*Pediat. clin. N. Amer., Feb., 1955*, pp. 127–149, 8 figs., 1 diag., 1 graph, 1955.

The authors provide an exhaustive account of histoplasmosis (*Histoplasma capsulatum*) with special regard to the diagnosis, source and avenue of initial infection, and the evolution and treatment of the disseminated form.

1827. Furcolow (M. L.) & Brasher (C. A.). **Chronic progressive (cavitary) histoplasmosis as a problem in tuberculosis sanatoriums.**—*Amer. Rev. Tuberc.*, 73, 5, pp. 609–619, 9 figs., 1956. [Spanish and French summaries.]

A systematic survey of the 600 patients at the Missouri State Sanatorium, Mount Vernon, was undertaken between March and August 1954, to determine the prevalence of histoplasmosis (*Histoplasma capsulatum*). The presence of the fungus was demonstrated by serological methods in 29 cases (4·8 per cent.) and by mycological in 14 (2·4). The implications of these findings may be seen by their application to the 16,500 tuberculosis beds in the area of high histoplasmin sensitivity, where 1,200 cases of chronic cavitary histoplasmosis might be expected to occur on a similar basis.

1828. Lazarus (A. S.) & Ajello (L.). **Aislamiento de Histoplasma capsulatum del suelo de una cueva en el Perú.** [Isolation of *Histoplasma capsulatum* from the soil of a cave in Peru.]—*Rev. Med. exp., Lima*, 9, pp. 5–15, 4 figs., 1955.

The authors report the isolation of *Histoplasma capsulatum* from the soil of a cave [cf. next entry] in the district of Tingo Maria, Peru, used as a roosting place by birds of a nocturnal fruit-eating species (*Steatornis caripensis*). For about ten years doctors had been familiar with an unexplained fever following visits to the cave. As a result of the authors' finding histoplasmin skin testing was carried out in the district; 43 per cent. of those examined reacted positively.

1829. Campins (H.), Zubillaga Z. (C.), Gómez López (L.), & Dorante (M.). **Estudio de una epidemia de histoplasmosis en el Estado Lara, Venezuela.** [Study of an epidemic of histoplasmosis in Lara State, Venezuela.]—*Gac. méd. Carácas*, 62, 3–4, pp. 85–109, 8 figs., 1955. [English summary.]

Following an excursion in February 1954 to a cave [cf. preceding entry] in Lara State, Venezuela, 11 out of 13 members of a party contracted histoplasmosis (*Histoplasma capsulatum*); in two it was severe, in three moderate, and in six benign, but all recovered. This is the first record of an epidemic of the disease in Venezuela [2, No. 1256]. When the authors visited the cave the only member to contract the disease was the one who had reacted negatively to histoplasmin beforehand. The fungus was isolated from four out of five soil samples from the cave, but not from a captured bat. The patients were believed to have inhaled spores in the atmosphere. The dustite respirator mask, Wilson No. 1, with which the authors were equipped, did not give sufficient protection.

1830. Smith (R. T.) & Raetz (S. J.). **Histoplasmosis. Preliminary report of a family outbreak in Minnesota.**—*Minn. Med.*, 38, 8, pp. 531–537, 2 figs., 1 graph, 1955.

The clinical and epidemiological aspects of an epidemic of histoplasmosis (*Histoplasma capsulatum*) involving a family of six adults and two children in a rural district of Wright County, Minnesota, are described. The symptoms

covered a wide range, and in one of the children the disease assumed the fatal disseminated form. In a preliminary survey of skin sensitivity to histoplasmin in the area of the outbreak, 20 out of a total of 76 persons (26·3 per cent.) reacted positively, five out of 40 (10·8) who had never been on the affected site, and 15 out of 30 (50) visitors or workers on the farm. It is probable, therefore, that a point source of infectious spores exists in the locality.

1831. Spicknall (C. G.), Ryan (R. W.), & Cain (A.). **Laboratory-acquired histoplasmosis.**—*New Engl. J. Med.*, 254, 5, pp. 210–214, 5 figs., 1956.

Two cases of probable and one of definite histoplasmosis (*Histoplasma capsulatum*) acquired in the laboratory [2, No. 76] are reported from the United States Public Health Service Hospital, Baltimore.

1832. Egbert (E.), Johnson (J. E.), Tsai (S. Y.), & Levin (W. C.). **Recent experiences with histoplasmosis.**—*Tex. St. J. Med.*, 51, 12, pp. 791–798, 4 figs., 1 map, 1955.

Skin test data and clinical experience indicate that histoplasmosis (*Histoplasma capsulatum*) is fairly common in the eastern half of Texas, but that the disease rarely becomes clinically apparent. Six proved cases (besides that of Hansen and Beene [1, No. 2141]) and four presumptive cases are reported from the John Sealy Hospital, Galveston. The reliability of bone marrow smears as the sole confirmation of the diagnosis of histoplasmosis is questioned, since organisms resembling the fungus were detected in specimens from four cases in which the clinical picture was not consistent with the presence of the disease in an active form. It is suggested that the pathogen may occasionally exist disseminated throughout the body for years without causing clinical illness.

1833. Collins (D. C.). **Histoplasma capsulatum: the principal cause of mesenteric lymphadenitis in Juveniles.**—*Miss. V. med. J.*, 77, 5, pp. 146–152, 1955.

Of 30,000 appendices examined over a 2½-year period at the College of Medical Evangelists, Los Angeles, California, 2,586 (8·6 per cent.) were positive for the presence of *Histoplasma capsulatum*. Of 151 from patients with proved mesenteric lymphadenitis, 78 (52·6 per cent.) were infected by the fungus. In a follow-up study in 1953–4 of 24 persons in the foregoing group whose appendices were removed 20 years previously, 15 (62·5 per cent.) still reacted positively to the histoplasmin skin test, while 20 (83·3) exhibited bizarre hilar pulmonary calcifications. On the basis of these findings *H. capsulatum* is believed to be the principal cause of mesenteric lymphadenitis in juveniles.

1834. Grayston (J. T.), Heeren (R. H.), & Furcolow (M. L.). **The geographic distribution of histoplasmin reactors among school age Children within a rural Iowa county.**—*Amer. J. Hyg.*, 62, 3, pp. 201–213, 5 diags., 1 graph, 1955.

This is a detailed analysis of the distribution of positive reactors to histoplasmin among the 3,146 schoolchildren tested in the 18 townships of Jackson County, Iowa, the over-all reaction rate being 13·2 per cent. The highest prevalence was in the western part, farthest away from the Mississippi River [2, No. 1825].

1835. Edwards (Phyllis Q.) & Kiaer (Joyce H.). **World wide geographic distribution of histoplasmosis and histoplasmin sensitivity.**—*Amer. J. trop. Med. Hyg.*, 5, 2, pp. 235–257, 1 map, 1956.

In this important study, supplemented by a six-page bibliography, information is assembled from many different sources to present as complete a picture as possible of the geographical distribution of histoplasmosis (*Histoplasma*

capsulatum) and histoplasmin sensitivity as it appears today [see preceding and next entries]. The Americas seem to be the principal focus of the disease, though it may also exist in endemic form (presumably with a much lower incidence) in some parts of Africa and south-eastern Asia.

1836. Van Uden (N.), Chaves-de-Almeida (R. P.), & Singer (H.). **Histoplasmin sensitivity in Portugal.**—*Portug. Acta. biol.*, 4, 1, pp. 27–41, 1954.

Of 955 recruits of the Portuguese army from various parts of the country [cf. 2, No. 1282] examined by the histoplasmin skin test, 28 reacted positively, with indurations of 2 to 6 mm. Reactions with a smallest diameter of 5 mm. or more were considered positive, those of 2 to 4 mm. were regarded as doubtful, and the others negative. Of the 28 positive reactors most became negative to a second test and the remaining nine gave a weak and doubtful reaction. The original reactors were also examined by the complement fixation test but all gave negative results. It is concluded that no widespread sensitivity to histoplasmin exists in Portugal.

1837. Myers (J. A.), Boynton (Ruth E.), Kernan (P.), Cowan (D.), & Jablon (S.). **Sensitivity to fungal antigens among Students at the University of Minnesota.**—*Amer. Rev. Tuberc.*, 73, 5, pp. 620–636, 1 map, 1956. [Spanish and French summaries.]

Of 12,099 male students at the University of Minnesota [cf. 2, No. 1562] tested with triple antigen (histoplasmin, blastomycin, and coccidioidin), 1,178 (9·7 per cent.) reacted positively. Among the 980 tested separately with histoplasmin, 982 with blastomycin, and 981 with coccidioidin there were, respectively, 881 (89·9), 295 (30), and 134 (13·7) positive reactors. Taking into account the fact that some 17 per cent. of the reactors to the triple antigen were not tested separately, the over-all percentages of sensitivity to histoplasmin, blastomycin, and coccidioidin are computed at 8·8, 2·9, and 1·3, respectively. Of the 881 known reactors to histoplasmin, 52 (5·9 per cent.) showed calcifications on roentgenograms.

1838. Riley (H. D.). **Epidemiologic studies of histoplasmin sensitivity.**—*U.S. Armed Forces med. J.*, 7, 6, pp. 817–838, 1 diag., 2 maps, 1956.

This is a survey, covering a period of one year, of the prevalence of sensitivity to histoplasmin and tuberculin in a group of 663 children in middle Tennessee, ranging in age from infancy to 15 years, who had previously resided in other parts of the United States or abroad. There were 93 positive reactors to histoplasmin (14 per cent.), 17 (2·6) to tuberculin, and only four (0·6) to both antigens. Sensitivity to histoplasmin rose with increasing age and the incidence was highest among children who had spent most of their lives in areas bordering on the mid-portions of the Mississippi and Ohio Rivers [cf. preceding entry]. The findings in this study, which are discussed in the light of 90 contributions to the relevant literature, confirm the reports of other workers that in the central States histoplasmosis (*Histoplasma capsulatum*) is a more common cause of pulmonary calcification than tuberculosis [cf. 2, No. 1281].

1839. Joe (L. K.), Eng (N.-I. T.), Edwards (Phyllis Q.), & Deck (F.). **Histoplasmin sensitivity in Indonesia.**—*Amer. J. trop. Med. Hyg.*, 5, 1, pp. 110–118, 3 graphs, 1956.

From a preliminary survey at Djakarta, Java, in 1953–4, involving a total of 2,542 persons—795 university students, 267 patients in a general hospital, 458 nurses, and 1,022 schoolchildren—skin sensitivity to histoplasmin [see

next entry] appears to be at least moderately prevalent in Indonesia, reactions of or exceeding 6 mm. of induration developing in 2·7 per cent. of the school-age group and in 9 to 12 per cent. of the adults. In all four groups males yielded somewhat higher positive results than females. The simultaneous tuberculin test was negative in about one-third of the histoplasmin reactors.

Out of a total of 2,311 persons X-rayed, only 25 (1·1 per cent.) presented evidence of pulmonary calcifications; excluding the schoolchildren the percentage was 1·5. Nearly all the calcifications occurred in subjects reacting positively to tuberculin, yet the proportion was higher in those positive to both antigens than in those positive to tuberculin only.

1840. Edwards (Phyllis Q.), Geser (A. G.), Kjølbye (E. H.), Meijer (J. H.), & Christensen (O. W.). **Histoplasmin testing in Africa and southern Asia.** —*Amer. J. trop. Med. Hyg.*, 5, 2, pp. 224–234, 1 map, 3 graphs, 1956.

The results of intradermal histoplasmin tests are reported for groups of schoolchildren and village populations, numbering more than 10,000 in all, in ten countries of Africa and Asia [see preceding entry]. The paucity of reactions of induration exceeding 8 mm. in diameter among the group tested in Libya, Egypt, Persia, Pakistan, India, Formosa, and Burma suggested the probable absence of histoplasmin sensitivity in these areas. In Viet-Nam and Indonesia, where a small proportion (less than 10 per cent.) of the reactions tend to be concentrated round 16 mm., specific infection by *Histoplasma capsulatum* may exist. In the whole of the Sudan, very few reactions could be regarded as evidence of specific infection, except in the southern province of Equatoria, where about 15 per cent. measured over 10 mm. in diameter.

It is reported in an addendum that only one person out of 394 in a Persian village and one out of 184 in Cyprus developed reactions to histoplasmin exceeding 8 mm. in diameter.

1841. Hazen (Elizabeth L.), Little (G. N.), & Mordaunt (Verna). **Isolation of Histoplasma capsulatum from two natural sources in the Mohawk Valley ; one the probable point source of two cases of histoplasmosis.**—*Amer. J. publ. Hlth*, 46, 7, pp. 880–885, 2 figs., 1 graph, 1956.

This is a report on the mycological and serological study of specimens from two brothers suffering from histoplasmosis (*Histoplasma capsulatum*) in the Mohawk Valley, New York (a new endemic area), one in an acute pulmonary and the other in a mild form, and from two natural sources of infection, a decayed tree and the litter of a chicken coop [2, No. 304 *et passim*]. The fungus was still obtainable in pure culture from the dust of the former after six months' storage at 3° to 6° C., but the latter gave positive results only on the day it was received. The tree is further considered to be the more likely source of infection since both patients were exposed to the dust at the time of felling a fortnight before the onset of their illness; on the other hand, the coop had not been cleared by the one brother (with the acute symptoms) for more than two years and the second had no association with the farm.

1842. Dyson (J. E.) & Evans (E. E.). **Delayed hypersensitivity in experimental fungus infections. The skin reactivity of antigens from the yeast phase of Histoplasma capsulatum.**—*J. Lab. clin. Med.*, 45, 3, pp. 449–454, 1955.

Four strains of *Histoplasma capsulatum*, three from human patients and one from a dog, were examined at the University of Michigan Medical School, Ann Arbor, in an attempt to obtain a yeast-phase antigen for skin tests. It was felt that such an antigen might be more specific than histoplasmin, which is obtained from the mycelial phase [cf. 2, No. 1540]. Cultures were grown in

a fluid medium in large flasks at 37° C. with continuous shaking. The treatment of cell-free filtrates of six-day cultures, killed by phenol or formaldehyde, with alcohol at various concentrations from 50 to 83 per cent. gave precipitates. These were dissolved in water, precipitated again with the same concentration of alcohol, and freed from electrolytes by dialysis. It was found that precipitates made using alcohol at percentages of 67, 71, and 75 reacted well with rabbits infected with *H. capsulatum* but not with those infected with *B. dermatitidis*. Further tests with a precipitate from 71 per cent. alcohol in animals 5 to 27 weeks after infection showed that it reacted well with animals infected with *H. capsulatum*, gave slight cross reactions in some of those infected with *B. dermatitidis*, and none with animals infected by the other fungi mentioned. A number of tests with commercial histoplasmin gave results of less sensitivity and specificity.

1843. Emmons (C. W.) & Rowley (D. A.). **Isolation of Histoplasma capsulatum from fresh and deep-frozen peribronchial lymph nodes of Dogs by Mouse inoculation.**—*J. Lab. clin. Med.*, 45, 2, pp. 303–307, 1955.

In this study at the Laboratory of Infectious Diseases, National Microbiological Institute, Bethesda, Maryland, homogenized peribronchial lymph node material from 111 dogs was injected into mice, which were killed four to six weeks later and their livers and spleens cultured for fungi. The lymph nodes were inoculated fresh in 92 cases, and frozen at −40° C. for up to five months in the remainder. *Histoplasma capsulatum* was isolated by this means from a total of 51 dogs.

Animal inoculation was found to be more effective than culture for the recovery of *H. capsulatum*, because many cultures were infected with saprophytic fungi and bacteria. Both techniques gave positive results in twelve cases from fresh tissue and four from frozen tissue, whilst positive results by inoculation alone were 48 and 12. *H. capsulatum* survived freezing in tissue at −40° C. for five months.

1844. Grayston (J. T.) & Salvin (S. B.). **Experimental histoplasmosis in immunized and nonimmunized Mice.**—*Arch. Path.*, 61, pp. 422–433, 1956.

Twenty-one-day-old male white Swiss mice of the Rocky Mountain Laboratory strain were immunized by intraperitoneal injection with 5 mg. of a formalin-killed preparation of the yeast phase of *Histoplasma capsulatum* [2, No. 1292], given in three or four equal injections at intervals of seven days, and then challenged at six or seven weeks by intracerebral or intranasal inoculation with a sublethal dose of yeast phase organisms (10^6 or under). The course of infection was followed in cultures of liver, spleen, brain, and lung material on Sabouraud's agar and in stained preparations of a number of organs. With intracerebral inoculation stained preparations revealed less extensive changes in the organs of immunized mice than in controls, the brains in particular being spared. Cultures from brain, liver, and spleen confirmed this. With the passage of time there was a steady decrease of infection in the organs of immunized mice, contrasting with the irregular findings in controls. With intranasal inoculation the course of infection in immunized mice was the same as that in controls.

In a further experiment a previous sublethal infection (10^6 cells) reduced by more than one-half the mortality following intracerebral challenge with 4×10^7 organisms, which killed all the controls in two weeks.

It was concluded that immunization, whether by inactivated organisms or sublethal intraperitoneal infection, improves the course of the disease following intracranial challenge.

1845. Rowley (D. A.) & Huber (Margret). **Growth of Histoplasma capsulatum in normal, superinfected, and immunized Mice.**—*J. Immunol.*, 71, 1, pp. 15–23, 1 fig., 2 graphs, 1956.

In further studies in the current series [2, Nos. 1559, 1560] chronic infections were induced in Swiss white male mice by the intravenous injection of small numbers of viable yeast cells of *Histoplasma capsulatum*. The initial rapid multiplication of the fungus was followed by a progressive decline in the number of viable organisms in the tissues. Chronically infected mice were resistant to the lethal effects of massive doses of yeast cells. The growth of the pathogen was inhibited in superinfected mice. Its development was not affected, however, by treatment of mice with serum from chronically infected mice or rabbits, or by immunization with a vaccine of *H. capsulatum*.

1846. Salvin (S. B.). **Hypersensitivity in Mice with experimental histoplasmosis.**—*J. Immunol.*, 75, 1, pp. 1–6, 1 graph, 1955.

In experiments (conducted with the technical assistance of J. C. Cory and Jane Nishio) at the National Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Montana, to measure the increased resistance of white Swiss mice after (*a*) immunization with dead cells of *Histoplasma capsulatum* and (*b*) infection with sublethal doses [2, No. 332 and next entry], a high percentage of infected mice died within 48 hours after challenge by the intraperitoneal route with large numbers of cells of the yeast phase. During the same period, deaths did not occur in mice not previously sensitized by a sublethal dose of the organism. Increasing the sensitizing dose increased the response to a standard shocking dose. The intracerebral and intraperitoneal routes gave the best sensitization. Although enhanced resistance to infection developed within four to five days after the administration of sublethal numbers of *H. capsulatum*, the hypersensitive state did not become evident for about 9 to 14 days. This interval could be curtailed by increasing the dose. Dead cells were effective as shocking agents, but not as sensitizing agents.

1847. Salvin (S. B.). **Resistance to reinfection in experimental histoplasmosis.**—*J. Immunol.*, 74, 3, pp. 214–221, 3 figs., 1955.

In this study at the Rocky Mountain Laboratory, Hamilton, Montana (conducted with the technical assistance of J. C. Cory and Jane Nishio), mice challenged 14 days after a sublethal infection with *H. capsulatum* [cf. preceding entry] were resistant to infection by the same organism, but not to *Blastomyces dermatitidis* or *Candida albicans*. Similarly infection with the *B. dermatitidis* or *C. albicans* did not induce resistance to *H. capsulatum*. The route of infection could be either intraperitoneal, intracerebral, intravenous, or subcutaneous. Resistance took about 72 hours to develop. Observations were made by culture on the number of organisms present in various tissues of animals which had been previously infected, and in those which were in the course of their first infection with *H. capsulatum*. It was found that previous infection was associated with fewer organisms in the spleen, liver, and the site of inoculation.

1848. Saslaw (S.) & Schaefer (J.). **Survival of Histoplasma capsulatum in experimental histoplasmosis in Mice.**—*Proc. Soc. exp. Biol., N.Y.*, 91, 3, pp. 412–414, 1956.

The results of further experiments at the College of Medicine, Ohio State University, demonstrated that the yeast phase of *Histoplasma capsulatum*, inoculated intraperitoneally into male Swiss white mice [2, No. 790], may frequently be recovered from the reticulo-endothelial tissues as late as 45

weeks after infection, though the lungs and heart blood are usually clear by the end of 16 weeks. Mice surviving previous sublethal challenge or previously given a dose of heat-killed organisms differ little in these respects, when challenged, from those in the primary-challenge group.

1849. Mayer (R. L.), Eisman (P. C.), Geftic (S.), Konopka (E.), & Tanzola (J.). **Sulfonamides and experimental histoplasmosis.**—*Antibiot. & Chemother.*, 6, 3, pp. 215–225, 1956.

At CIBA Pharmaceutical Products Inc., Summit, New Jersey, 14 sulphonamides were evaluated for their *in vitro* and *in vivo* activity against *Histoplasma capsulatum*. Although the yeast phase proved more sensitive than the mycelial to the action of the drugs, their effects on the fungus in pure culture were relatively inconsiderable. Used as admixtures in the diet, however, the compounds were highly effective in the treatment of mice inoculated with lethal doses of *H. capsulatum* [2, No. 1560 and next entry].

1850. Drouhet (E.), Schwarz (J.), & Bingham (Eula). **Evaluation of the action of nystatin on Histoplasma capsulatum in vitro and in Hamsters and Mice.**—*Antibiot. & Chemother.*, 6, 1, pp. 23–35, 2 figs., 3 graphs, 1956.

This is a joint report from the Jewish and General Hospitals, Cincinnati, Ohio, of experiments which demonstrated the fungistatic action of nystatin on 14 different strains of *Histoplasma capsulatum* of American and African origin and its beneficial effect on the fulminating, moderately acute, and chronic symptoms induced by inoculation in hamsters and mice [cf. preceding entry]. The drug proved to be non-toxic in therapeutic doses.

1851. Courtois (G.), Segretain (G.), Mariat (F.), & Levaditi (J.-C.). **Mycose cutanée a corps levuriformes observée chez des Singes africains en captivité.** [Cutaneous mycosis with yeast-like bodies observed in African Monkeys in captivity.]—*Ann. Inst. Pasteur*, 89, 1, pp. 124–127, 1955.

Notwithstanding the negative outcome of attempts at pure culture, animal inoculation experiments, and histoplasmin skin tests, the authors attribute a spontaneous mycosis of African monkeys (*Cynocephalus babuin*), originating in French Guinea and kept in captivity at the Pasteur Institute, Paris, to infection by *Histoplasma duboisii* [2, No. 1142]. Their opinion is based on the symptoms of the disease, the morphology of the lesions, and the presence in the latter of yeast-like elements, 8·2 by 6·9 μ, occurring singly or in chains of two to five.

1852. Salvin (S. B.). **Acquired resistance in experimental histoplasmosis.**—*Trans. N.Y. Acad. Sci.*, Ser. II, 18, 5, pp. 462–468, 1956.

Up-to-date information is presented on the acquisition of resistance to histoplasmosis (*Histoplasma capsulatum*) in experimental animals [2, No. 332, 1292], citing 13 contributions to the relevant literature, including ten by the author and collaborators.

1853. Pine (L.) & Peacock (C. L.). **Studies on the growth of Histoplasma capsulatum. II. Growth of the yeast phase on agar media.**—*J. Bact.*, 70, 4, pp. 375–381, 4 figs., 1955.

The results of further studies at the National Microbiological Institute, Bethesda, Maryland, on the growth of *Histoplasma capsulatum* [2, No. 1274], this time on agar media, suggest that agar contains fatty acids which inhibit the growth of the yeast phase of the organism. There is evidence that -SH

groups [1, No. 1423] are required to sustain, or at least to initiate, growth of *H. capsulatum*. This might explain the authors' observation that the organism fails to grow when inoculated at the surface of an agar plate, but will grow in liquid cultures where the inoculum aggregates at the bottom of the tube. This aggregation may lead to a local accumulation of -SH groups, or perhaps some other factor, brought over with the inoculum, may be involved. In view of the stimulatory effect of whole blood it is possible that its red blood cell component serves to maintain a constant source of the -SH groups required for the growth of *H. capsulatum*, while the albumin fraction presumably supplies and maintains a non-toxic source of fatty acids.

A simple, safe, and rapid procedure for removing the growth of certain pathogenic micro-organisms from the surface agar media is described.

1854. Drouhet (E.) & Schwarz (J.). **Croissance et morphogenèse d'Histoplasma. I. Étude comparative des phases mycélienne et levure de 18 souches d'Histoplasma capsulatum d'origine américaine et africaine.** [Growth and morphogenesis of *Histoplasma*. I. Comparative study of the mycelial and yeast phases of 18 strains of *Histoplasma capsulatum* of American and African origin.]—*Ann. Inst. Pasteur*, 90, 2, pp. 144–160, 1 pl., 3 figs., 4 graphs, 1956. [English summary.]

Variations are described in the gross appearance, development rate, and pigmentation in the mycelial phase of 18 strains of *Histoplasma capsulatum* (14 American and four African) and one of *H. farciminosum* from Burma. Maize meal agar promoted better sporulation, including the development of tuberculate spores, than did Sabouraud's dextrose agar, but growth on the former medium was slower and poorer than on the latter. Conversion to and maintenance of the yeast phase were greatly facilitated by the use of Kurung's egg medium [2, No. 769]. The cell sizes in this phase were very variable, most of the small ones measuring about 2 and the larger ones ranging from 6 to 17 μ in diameter. Large forms were not restricted to the African strains, being abundant in two of the American isolates and fairly numerous in three, and it would seem, therefore, that there is no justification for the classification of the megasporous African strains as a distinct species, *H. duboisii* [2, No. 334 *et passim*].

1855. Joe (L. K.) [as Lie Kian-Joe], Tjokronegoro (S.), Eng (N-I. T.), & Fok (L. G.). **A case of progressive histoplasmosis in Indonesia.**—*Docum. Med. geogr. trop.*, 5, 2, pp. 132–134, 3 figs., 1956.

This is a report from the School of Medicine, University of Indonesia, and Tjikini Hospital, Djakarta, on a fatal case of progressive histoplasmosis (*Histoplasma capsulatum*) in a 44-year-old, Java-born, male Chinese. The fungus was demonstrated in the sputum, blood, and papules on the tongue. Inoculation experiments on white mice and spotted rats gave positive results with retroculture of the pathogen. Infection is believed to have been contracted in Indonesia [cf. 1, Nos. 897, 1394, 1839], where most of the patient's life was spent.

1856. Sones (C. A.), Rotkow (M. J.), & Dunn (R. C.). **Acute disseminated histoplasmosis. Report of case in an Adult.**—*J. Iowa St. med. Soc.*, 45, 9, pp. 463–468, 6 figs., 1955.

The fatal case of histoplasmosis (*Histoplasma capsulatum*) in a 57-year-old female herein reported from Des Moines, Iowa, is the first of the acute disseminated type to be recorded in the State.

1857. York (J. R.). **An interesting case of histoplasmosis.**—*Virginia med. Mon.* (*Semi-Mon.*), 82, 11, pp. 514–515, 1955.

From the University of Virginia Hospital the author reports a case of systemic histoplasmosis (*Histoplasma capsulatum*) associated with Addison's disease [2, No. 1537] in a 56-year-old electrician. The possibility that infection was acquired in the Panama Canal Zone during a period of service in that area from 1920 to 1923 is considered. In any event, entrance was evidently gained through the alimentary tract, since chest X-rays gave uniformly negative results. The patient was transferred to the National Institute of Health, Bethesda, Maryland, where death ensued. Gross pathological findings at the autopsy were replacement of the adrenals by yellowish tissue and calcification, necrotizing papillitis of the kidneys, and complete erosion of the left vocal chord and left half of the epiglottis, accompanied by ulceration and oedema of the pharynx and larynx.

1858. Crispell (K. R.), Parson (W.), Hamlin (J.), & Hollifield (G.). **Addison's disease associated with histoplasmosis. Report of four cases and review of the literature.**—*Amer. J. Med.*, 20, 1, pp. 23–29, 1956.

Four cases of Addison's disease associated with proved histoplasmosis (*Histoplasma capsulatum*) [see preceding entry] are reported from the School of Medicine, University of Virginia. At the time of writing, three of the patients (males aged 43, 44, and 45) were in fair health five years, three years, and three months, respectively, after the diagnosis of the two diseases had been established. The autopsy on the fourth, also a male aged 54, who succumbed about a year and ten months after diagnosis, revealed destruction of the adrenal glands by caseation necrosis. The fungus was detected in the necrotic material.

It is concluded that *H. capsulatum* should be suspected as an etiological agent in Addison's disease, as suggested by these findings and a review of 103 cases in the relevant literature with adrenal involvement in 36 (35 per cent.)—a higher incidence than any recorded in connexion with other systemic mycoses.

1859. Altamira (J.), Amuchastegui (S. R.), Brusco (G. R.), & Herrero (A.). **Histoplasmosis de forma diseminada ; presentación de un caso clínico con evolución favorable.** [Disseminated histoplasmosis; presentation of a clinical case with favourable development.]—*Día méd.*, 26, 77, pp. 2268–2277, 1954.

Full details are given of a case of disseminated histoplasmosis (*Histoplasma capsulatum*) originating in the larynx of a 29-year-old inhabitant of Córdoba Province, Argentina [1, No. 2278]. A cure was effected with aureomycin but the possible beneficial effect of other medicaments employed cannot be excluded.

1860. Sprofkin (B. E.), Shapiro (J. L.), & Lux (J. J.). **Histoplasmosis of the central nervous system. A case report of Histoplasma meningitis.**—*J. Neuropath.*, 14, 3, pp. 288–296, 4 figs., 1955.

Central nervous lesions were found at autopsy in six out of 11 patients with generalized histoplasmosis (*Histoplasma capsulatum*) admitted to the Vanderbilt University Hospital, Nashville, Tennessee, between 1932 and 1953. The clinical and pathological features of one case, presenting an unusual necrotizing arteritis of the meningeal vessels, are described in detail. On the basis of the findings, histoplasmosis must be added to the list of granulomatous infections tending to result in pleocytosis and reduction in sugar content of the cerebrospinal fluid.

1861. McMahon (J. M.) & Kessler (C. R.). **Histoplasmosis resembling pulmonary malignancy. Treatment by pulmonary resection. Case report.**—*J. med. Ass. Ala.*, 25, 10, pp. 221–224, 3 figs., 1956.

A case of histoplasmosis (*Histoplasma capsulatum*) in a 46-year-old coloured female, simulating pulmonary carcinoma in its clinical history and radiographic and pathological findings, is reported jointly from the General Hospital, Bessemer, and the Baptist Hospital, Birmingham, Alabama. Pulmonary resection resulted in a complete cure.

1862. Menu (P.) & Revil (H.). **Sur un cas d'histoplasmose pulmonaire décelé à Yaoundé, à l'occasion d'un examen systématique.** [On a case of pulmonary histoplasmosis detected at Yaoundé on the occasion of a systematic examination.]—*Bull. Soc. Path. exot.*, 48, 6, pp. 810–814, 1 pl., 1956.

In the course of mass radiography at Yaoundé, French Cameroons, calcifications were detected in the lungs and liver of a healthy 22-year-old agricultural worker who responded positively to an intradermal test with histoplasmin. Although *Histoplasma capsulatum* could not be isolated, there is considered to be no doubt that it had at one time been present in the system, leaving the calcifications as a residual effect.

1863. Puckett (T. F.). **Pulmonary histoplasmosis.**—*Amer. J. Surg.*, 90, 1, pp. 92–100, 4 figs., 1955.

Information is presented from the Fitzsimons Army Hospital, Denver, Colorado, on the symptomatology, laboratory data, and pathology of 67 cases of pulmonary histoplasmosis (*Histoplasma capsulatum*), of which 30 have already been reported [2, No. 533 and *J. thorac. Surg.*, 22, pp. 131–139]. The findings are discussed in relation to 34 contributions to the literature on the subject.

The surgical importance of the disease lies mainly in its propensity to leave residual foci simulating other conditions, e.g., tuberculosis and neoplasms. The organisms in these stabilized foci appear to be mostly non-viable, judging by their atypical morphology and the disappointing results of attempts at culture. The need is emphasized for the application of special staining procedures and meticulous care in examination of all granulomatous lesions. The patient's history and response to intradermal antigens should be known at the time of tissue examination.

1864. Nuttall-Smith (J.). **Pulmonary histoplasmosis accompanied by erythema nodosum.**—*Canad. med. Ass. J.*, 74, 1, pp. 59–60, 1956.

Evidence is summarized from recent contributions to the literature tending to show that the usual course of pulmonary histoplasmosis (*Histoplasma capsulatum*), which is common in certain areas of the United States, is benign, leaving a symptomless calcification and a positive skin reaction. A case of the benign type, accompanied by erthyema nodosum and arthralgia, in a 13-year-old girl is reported from the Kamloops General Hospital, British Columbia.

1865. Binford (C. H.). **Histoplasmosis. Tissue reactions and morphologic variations of the fungus.**—*Amer. J. clin. Path.*, 25, 1, pp. 25–36, 5 figs., 1955.

Twenty-two fatal cases of histoplasmosis in the files of the Armed Forces Institute of Pathology, Washington, D.C., are described. Histiocytic lesions of the reticulo-endothelial system were seen in 19 cases, often with caseous necrosis. In eight of these and in two others epithelioid granulomas were seen. Caseous necrosis was again common, and the presence of giant cells in most lesions of this type made the resemblance to the histological picture seen in

tuberculosis very close, and sarcoidosis was also mimicked. *Histoplasma* [*capsulatum*] was not often seen in the non-caseous granulomas unless Gridley's stain was used. The adrenal was involved in all but one case. The histology of the enlarged spleens showed a striking resemblance to kala-azar. Vegetative endocarditis affected the aortic valve in two cases and the tricuspid in one. The brain was examined in 15 cases, and multiple abscesses due to *Histoplasma* were found in two. Extracellular forms regarded as unusual phases of the fungus were up to 15 μ in diameter, and often distorted; they stained with periodic acid-Schiff reaction or with Gridley's stain. Occasional hyphal structures 15 to 20 μ in length were seen in necrotic adrenal tissue and in one section of necrotic renal medulla.

1866. Esandi (F.) & Chicote (M. N.), with the collaboration of E. F. Lascano. **Histoplasmosis localizada.** [Localized histoplasmosis.]—*Prensa méd. argent.*, 42, 22, pp. 1610–1612, 2 figs., 1955.

A case is reported from Mar del Plata, Argentina, of histoplasmosis (*Histoplasma capsulatum*) of the palate [cf. 1, Nos. 313, 942, 2277] in an 80-year-old man, who recovered after a protracted course of sulphadiazine therapy.

1867. Chin (T. D. Y.), Ney (P. E.), Saltzman (B. N.), Paxton (G. B.), Rakich (Jennie H.), Ware (Mildred), Whitmore (Margaret), & Furcolow (M.). **An epidemic of histoplasmosis among School Children in Arkansas.**—*Sth. med. J.*, 49, 8, pp. 785–792, 4 figs., 5 graphs, 1956.

The clinical and epidemiological features of an epidemic of histoplasmosis (*Histoplasma capsulatum*) occurring in a group of six- to ten-year-old elementary schoolchildren at Mountain Home, Arkansas, in the spring of 1955 are described. There were 36 reported cases among the 361 children included in the study, but it would appear from the results of serological tests and an X-ray survey that some 146 children were actually infected. Significantly higher percentages of histoplasmin sensitivity, positive reactions to serological tests, and positive chest X-ray findings were recorded among the inmates of the Mountain Home School than within a group of slightly older children at a school situated half-a-mile away. It is concluded from the available evidence that infection was acquired within the school premises, possibly from contaminated coal dust.

1868. Schwarz (J.) & Bingham (Eula L.). **The pathogenesis of canine histoplasmosis.**—*J. Amer. vet. med. Ass.*, 128, 12, pp. 611–613, 3 figs., 1956.

The autopsies on seven dogs from the endemic area of histoplasmosis (*Histoplasma capsulatum*) [cf. 2, No. 1294] reported in this joint contribution from the Jewish and General Hospitals, Cincinnati, Ohio, revealed uniformly typical primary complexes in the form of discrete, generally single, characteristically subpleural nodules in the lungs and satellite lymph nodes. Hence it is concluded that in dogs, as in man, the lung is the principal portal of entrance for the fungus.

1869. Eby (C. H.) & Ringen (L. M.). **Canine histoplasmosis in the Pacific Northwest.**—*J. Amer. vet. med. Ass.*, 127, 942, pp. 250–251, 2 figs., 1955.

A case of histoplasmosis (*Histoplasma capsulatum*) in a three-year-old cocker spaniel [2, No. 1552, 1843] is reported from the College of Veterinary Medicine, Pullman, Washington, apparently the first from the Pacific Northwest. The inoculation of a white mouse with a suspension from the intestines of the animal produced infection, and the fungus was recovered in culture on Sabouraud's agar.

1870. Peck (S. M.), Bergamini (Rose), Kelcek (Louise C.), & Rein (C. R.). **The serodiagnosis of moniliasis. Its value and limitations.**—*J. invest. Derm.*, 25, 5, pp. 301–310, 1955.

The *Monilia* complement-fixation test and an investigation into its specificity and sensitivity are described from the Mount Sinai and New York University Hospitals, New York [cf. 2, No. 1299]. The most sensitive and specific antigen was obtained from the filtrate of a culture of *Candida albicans* from a fatal case of generalized moniliasis in a child. The incidence of positive reactions to the test in a series of 793 patients with a variety of unselected dermatoses was 13·5 per cent., whereas 75 per cent. of 48 patients with clinical moniliasis gave positive tests. It was shown that the antigen did not contain any Wassermann-reacting substances. There was no correlation between positive stool cultures and reactions to the test in a series of 50 patients. Long-term tetracycline therapy did not affect results. There was no correlation between the incidence or degree of positive results and gastro-intestinal complaints, but a marked correlation was found with the development of ano-genital pruritis. Of 27 sero-positive reactors prior to tetracycline therapy, 81 per cent. developed ano-genital pruritis shortly after the commencement of this therapy.

1871. Mankiewicz (Edith). **Mycobacterium tuberculosis and Candida albicans: a study of growth-promoting factors.**—*Canad. J. Microbiol.*, 1, 2, pp. 85–89, 1 pl., 1954.

In this paper from the Royal Edward Laurentian Hospital, Montreal, a new growth factor, possibly a metabolic product, from *Candida albicans* is described, which stimulates the growth of *Mycobacterium tuberculosis* and other tubercle bacilli of reduced viability or multiplication rate, such as are often found after a prolonged treatment of a patient with streptomycin or isonicotinic acid hydrazide. Also described is a method for the earlier detection of *M. tuberculosis* growing on Loewenstein's medium. This consists in inoculating the medium with the pathological specimen suspected to contain tubercle bacilli and superinoculating it with suspensions of *C. albicans* having an enhanced dependence upon the presence of tubercle bacilli for growth on this medium. Colonies of *C. albicans* then 'trace' the presence of *M. tuberculosis*.

1872. Scherr (G. H.). **The laboratory diagnosis of mycotic infections. II. Moniliasis.**—*Neb. St. med. J.*, 39, 8, pp. 342–346, 1954.

Studies on moniliasis at the Department of Microbiology, University School of Medicine, Omaha, Nebraska, indicate that the presence of the pathogen or other similar yeasts in normal people often renders it difficult to determine whether or not *Candida albicans* should be considered pathogenic in any given person. Clinical and laboratory methods (immunological, cytological, cultural, and pathological) for the diagnosis of moniliasis and for differentiating between the pathogen for this disease and other yeasts are described.

1873. Kärcher (K. H.). **Experimentelle Untersuchungen zur Pathogenität und biologischen Wirkung der Candida albicans an Mensch und Tier.** [Experimental studies on the pathogenicity and biological effect of *Candida albicans* on Man and Animals.]—*Arch. klin. exp. Derm.* (formerly *Arch. Derm. Syph., Wien*), 202, 5, pp. 424–448, 21 figs., 1956.

The following conclusions are drawn from the results of the author's important study at the Department of Dermatology of the Municipal Hospitals, Mannheim, Germany [2, No. 1323]. The inhibition of the growth of *Bacterium* [*Escherichia*] *coli* and apathogenic yeasts following antibiotic therapy, permits

the multiplication of the more resistant *Candida albicans* and produces a disturbance of the physiological balance in the intestinal tract which may result in serious ill effects.

The application of patch tests to the skin gives a clue to the enzymatic activity of *C. albicans* and related yeasts. The enzymes can only be demonstrated in association with the living cell. The cell-free filtrate of *C. albicans* induces a positive intradermal reaction in sensitized subjects and in normal ones a transient erythema, so that it evidently contains an antigen which proved to be absent from the filtrates of apathogenic species. Animal inoculation is considered to be an unsuitable method for the demonstration of pathogenicity in yeasts and should be replaced by the chorio-allantoic membrane test.

1874. Huppert (M.), Macpherson (D. A.), & Cazin (J.). **Pathogenesis of Candida albicans infection following antibiotic therapy. I. The effect of antibiotics on the growth of Candida albicans.**—*J. Bact.*, 65, 2, pp. 171–176, 2 graphs, 1953. [Received April, 1956.]

At the Department of Bacteriology and Immunology, University of North Carolina School of Medicine, it was found that the growth of *Candida albicans* could be measured by determining the total cell nitrogen by means of the micro-Kjeldahl method. Growth was stimulated significantly when three different lots of aureomycin hydrochloride were added to a broth culture medium [see next entry] in concentrations greater than 0·1 mg. per l. Penicillin, chloramphenicol, streptomycin, and terramycin did not have a similar effect. Several explanations for the increased incidence of candidiasis following continuous antibiotic therapy are discussed. It is suggested that some of the normal bacterial inhabitants of the intestinal tract may exert a specific antibiotic effect on *C. albicans* and that the elimination of this factor permits the fungus to exert its full pathogenic potentialities.

1875. Huppert (M.) & Cazin (J.). **Pathogenesis of Candida albicans infection following antibiotic therapy. II. Further studies of the effect of antibiotics on the in vitro growth of Candida albicans.**—*J. Bact.*, 70, 4, pp. 435–439, 2 graphs, 1955. [Received April, 1956.]

In further studies at the University of North Carolina School of Medicine on the effect of antibiotics on the growth of *Candida albicans in vitro* [see preceding entry], the presence of aureomycin, neomycin, and bacitracin in broth cultures produced a total growth greater than that in the controls. No similar stimulation occurred with magnamycin, erythromycin, or the aureomycin preparation containing parabens. The stimulation obtained with pure aureomycin was eliminated by the addition of methyl and propyl parabens, although the growth obtained was not significantly lower than that of the control. It is suggested that parabens should be investigated for possible use as a prophylactic in conjunction with antibiotic therapy. No correlation was found between the ability of an antibiotic to stimulate the growth of *C. albicans in vitro* and the association of the antibiotic with the development of superimposed infections during therapy.

1876. Huppert (M.), Cazin (J.), & Smith (H.). **Pathogenesis of Candida albicans infection following antibiotic therapy. III. The effect of antibiotics on the incidence of Candida albicans in the intestinal tract of Mice.**—*J. Bact.*, 70, 4, pp. 440–447, 1955.

In further studies on the treatment of *Candida albicans* infection at the University of North Carolina School of Medicine [see preceding entry] all the antibiotics used (chlorotetracycline [aureomycin] hydrochloride alone and

with parabens, chloromycetin, oxytetracycline hydrochloride, dihydrostreptomycin, magnamycin, neomycin, oxytetracycline (amphoteric), erythromycin, penicillin, and tetracycline), when administered orally, promoted the establishment of *C. albicans* in the intestinal flora of mice. There were statistically significant differences between the reactions of the two pure breeds of white mice used in these experiments. The RAP strain from Rockland Farms tended to be more susceptible to exposure to a suspension of the fungus administered during a course of antibiotic treatment and to be more uniform in response than the CF–1 strain from Carworth Farms. Such differences must be considered in comparisons of the results of separate investigations.

The technique employed in this investigation has produced results parallel with experience of antibiotic therapy in human medicine, and may serve as an experimental model for testing the efficacy of anti-fungal compounds. These could be used either as prophylactic agents for preventing the onset of fungus infection or as chemotherapeutants for such infection when it is established.

1877. Bernard (J.), Mathe (G.), & Drouhet (E.). **Les infections à Candida au cours des hémopathies décompensées et leur traitement par la nystatine.** [*Candida* infections in the course of uncompensated haemopathies and their treatment with nystatin.]—*Sang*, 26, 5, pp. 490–495, 1955.

Uncompensated haemopathies treated with antibiotics and cortisone are frequently complicated by the development of *Candida albicans*. In six cases including one of septicaemia, the oral administration of nystatin [2, No. 1618] at dosages of up to 1 gm. daily resulted in the rapid and complete disappearance of the fungal lesions.

1878. Mlczoch (F.). **Pilzerkrankungen in der inneren Medizin.** [Mycoses in internal medicine.]—*Wien. klin. Wschr.*, 67, 30, pp. 537–542, 1955.

From the Second Medical University Clinic, Vienna, the author describes seven cases of fungal infection caused, e.g., by *Candida* spp. (including *C. albicans*) and *Torula* sp. to illustrate his thesis that the recent increase in endogenous mycoses is attributable to the extended therapeutic application of antibiotics and cortisone.

1879. Windisch (S.) & Staib (F.). **Vorkommen von Hefen im Darmtrakt Kranker.** [Occurrence of yeasts in the digestive tract of patients.]—*Zbl. Bakt.*, Abt. 1 (Orig.), 164, 6/7, pp. 493–507, 1955.

Yeasts were isolated from 429 (37 per cent.) of 1,158 samples of faeces from hospital patients at Würzburg, Germany, examined in the course of a year (1952–3), among the species represented being *Candida albicans* (51·2 per cent.), *C. krusei*, *C. tropicalis*, *C. parapsilosis*, *Trichosporon cutaneum* [2, No. 912], *C. brumpti*, and *C. pelliculosa* [2, No. 1588]. The organisms were associated predominantly with pulmonary tuberculosis and disorders of the stomach, pancreas, and intestinal tract and were most frequent during the late summer (August to October) and in February. Of the 13 subjects harbouring *C. albicans* in a particularly active form, 12 had just been receiving antibiotic therapy. Samples from a patient with enterocolitis yielded *C. krusei* in an almost pure state.

1880. Sharp (J. L.). **The growth of Candida albicans during antibiotic therapy.**—*Lancet*, 266, 6808, pp. 390–392, 1954.

At the Knightswood Hospital, Glasgow, 174 males over the age of 14, admitted for the treatment of pneumonia, were divided into two groups, one receiving an average of 14·2 gm. of oxytetracycline, the other an average of

37 gm. of sulphadiazine. Before treatment was started and on the third, fifth, seventh, and ninth days, rectal and post-nasal swabs were taken and inoculated on to Sabouraud's medium. Owing to the fact that *Candida albicans* was not isolated from post-nasal swabs, throat swabs were used instead after 51 cases had been examined. Sputum was also examined before treatment was started. *C. albicans* was found in the rectal swabs of 5 out of 174 patients before treatment, in the sputum of 84 out of 174, and in the throat swabs of 27 out of 103. The presence of *C. albicans* in the sputum did not appear to be related to the disease for which the patient was admitted. During treatment, there was no increase in the number of patients treated with sulphadiazine from whom *C. albicans* was isolated, but two to four days after treatment stopped, there was a small increase in positive results from sputum and rectal swabs. The patients who received oxytetracycline, on the other hand, showed a considerably higher incidence of *C. albicans* during treatment; 42 per cent. of them had *C. albicans* in the throat swab, 61 per cent. in the sputum, and 59 per cent. in the rectal swab. These patients showed no evidence that *Candida* was causing any disease, nor were there any more serious side-effects from the treatment in this group.

1881. Ansel (M.) & Gauthier (C.). **Candidose expérimentale chez la Souris par injection intraperitonéale avec mucine. Influence du sexe.** [Candidiasis experimentally induced in the Mouse by intraperitoneal injection of mucine. The influence of sex.]—*Ann. Parasit. hum. comp.*, 30, 3, pp. 312–317, 1955.

Intraperitoneal injection into mice of a 1 per cent. suspension of *Candida albicans* with 5 per cent. mucin induced generalized infection in all cases. Subcutaneous or intramuscular injections did not produce generalized infection. Following intraperitoneal injection, male mice developed acute infection and died in three to five days, while females developed a slower form which continued to evolve for at least a fortnight, and then terminated in death or passed into a chronic stage which persisted for some months. The most convenient method of detecting the fungus in the lesions is by contact impression slides stained by the May-Grünwald-Giemsa method.

1882. Winter (W. D.) & Foley (G. E.). **Enhancement of Candida infection: differential distribution of renal lesions in Mice treated with aureomycin.**—*J. infect. Dis.*, 98, 2, pp. 150–156, 2 figs., 1956.

The spread of *Candida albicans* following intraperitoneal inoculation into mice (Carworth Farms, Webster Strain) at the Children's Medical Center, Boston, Massachusetts, was found to be effected by direct haematogenous dissemination. The major pathology, confined to the renal tissues, consisted of discrete miliary abscesses deep in the substance of the kidney.

The administration of hog gastric mucin exerted no significant influence either on mortality or the character of the renal lesions. On the other hand, the combination with the standardized inocula of aureomycin, terramycin, or tetracycline not only increased mortality at an early stage of infection but resulted in a massive invasion of the renal cortex from the peritonealized surfaces of the kidney, contrasting with the deep-seated lesions observed in the control and mucin-treated series. The effects of cortisone acetate were identical with those of aureomycin. The enhancement of pathogenicity by the antibiotics appeared to be associated with decreased haematogenous dissemination.

1883. Ambrosioni (P.) & Masoni (S.). **Ricerche sperimentali su Conigli sani ed infettati con Candida albicans sottoposti a trattamento con clorotetraciclina (aureomicina). Nota I. Sensibilità del Coniglio alla clorotetraciclina ed azione**

di questa sull' andamento di una micosi sperimentale. Nota II. Tentativi di profilassi mediante somministrazione di vari gruppi di vitamine e di germi del gruppo enterico. [Experimental researches on Rabbits, healthy and infected with *Candida albicans*, treated with chlorotetracycline (aureomycin). Note I. Sensitivity of the Rabbit to chlorotetracycline and the action of this substance on the development of an experimental mycosis. Note II. Attempts at prophylaxis by means of the administration of various groups of vitamins and bacteria of the enteric group.]—*Boll. Ist. sieroter. Milano*, 34, 7–8, pp. 408–417; 418–424, 11 figs., 1955.

In studies at the Institute of Hygiene, University of Modena, Italy, aureomycin administered *per os* to rabbits at 14 mg./kg. daily caused death after four to 14 days. In other rabbits inoculated intravenously with 1 ml. of a broth culture of *Candida albicans* [cf. **2**, No. 1305] three, six, or seven days after the commencement of aureomycin treatment death occurred likewise after four to fourteen days. Controls inoculated with the fungus but not treated with the antibiotic survived an average of 31 days.

In the experiments described in Note II with rabbits given aureomycin and inoculated similarly with *C. albicans* survival was prolonged for a few days by the administration of various vitamins *per os*. The lesions were unaffected by vitamin treatment. When rabbits were given aureomycin for seven days, then inoculated with *C. albicans*, and at the same time dosed *per os* with broth cultures of *Bacterium* [*Escherichia*] *coli*, *B. proteus*, and *Enterococcus* they died after 9 to 13 days. It is concluded that rabbits are highly sensitive to aureomycin, which apparently produces shock leading to the release of substances resembling histamine. The antibiotic favoured the localization of infection in various organs.

1884. Winter (W. D.) & Foley (G. E.). **Failure of Candida stellatoidea to qualify as a species.**—*J. infect. Dis.*, 97, 3, pp. 227–230, 1955.

The results of a study at the Children's Medical Center, Boston, Massachusetts, of 195 strains of *Candida* showing a complete range of variations from the characters regarded as diagnostic of *C. albicans* to those considered typical of *C. stellatoidea* are described and tabulated, emphasizing biochemical reactions, morphology, and pathogenicity to rabbits. No justification could be found for the separation of the strains into two species [cf. **2**, Nos. 1598, 1600].

1885. Winsten (S.) & Murray (T. J.). **Virulence enhancement of a filamentous strain of Candida albicans after growth on media containing cysteine.**—*J. Bact.*, 71, 6, p. 738, 1956.

In studies at the Department of Bacteriology, Rutgers University, New Brunswick, New Jersey, the addition of cysteine to Sabouraud's glucose agar enhanced the virulence of a filamentous strain of *Candida albicans* and suppressed filamentation.

1886. Windisch (S.). **Beiträge zur Biologie und Systematik der Kahmhefen.** [Contributions to the biology and systematics of the pellicle-forming yeasts.] —*Arch. Mikrobiol.*, 21, 1, pp. 80–95, 1954. [Received April, 1956.]

Two of the 52 strains of pellicle-forming yeasts examined at the Technical University, Berlin-Charlottenburg, were assigned to *Candida guilliermondii* and 18 to *C. krusei*, which differs from *C. mycoderma* (a non-sporulating form of *Pichia membranaefaciens*) in the fermentation of glucose, an aberrant habit of pseudomycelial growth, and the assimilation of citric acid.

1887. Kaffka (A.), **Tellurithaltige Serum Nährmedien zur Differenzierung von Candida albicans.** [Tellurite-containing serum nutrient media for the differentiation of *Candida albicans*.]—*Zbl. Bakt., Abt.* 1 (*Orig.*), 165, 4, pp. 264–274, 18 figs., 1956. [English, French, and Russian summaries.]

At the Hygienic Institute, Hamburg, Germany, the growth of *Candida albicans* on Clauberg-II-serum agar and a transparent serum-tellurite agar (400 ml. meat juice agar, 320 ml. distilled water, 32 ml. 1 per cent. potassium tellurite solution, and 80 ml. ox serum) was distinguishable after 18 hours from that of other *C.* spp. and anascosporogenous and ascosporogenous yeasts by the development of the specialized *Mycotorula*, *Mycotoruloides*, and *Mycocandida* forms. The demonstration of chlamydospores confirmed the diagnosis.

1888. Morton (Mary M.). **A note on the detection of Candida albicans.**—*Aust. J. Derm.*, 3, 1, pp. 13–14, 2 figs., 1955.

At St. Vincent's Hospital, Melbourne, a medium consisting of 1 per cent. peptone and 1 per cent. agar in tap water has proved very satisfactory for the identification of *Candida albicans* [2, No. 1308]. In general, colonies presenting the typical features described by Weld [2, No. 339] may be accepted as belonging to the species.

1889. Jirousek (L.) & Jirsák (J.). **Antifungal properties of organic polysulphides from Cabbage.**—*Naturwissenschaften*, 43, 16, pp. 375–376, 1956.

At the Endocrinological Institute, Prag II, Czechoslovakia, the sharp-smelling, oily fraction obtained from mashed cabbage by direct steam distillation and extraction with chloroform inhibited the growth of *Candida albicans* at a concentration of 1 : 10^4 in 24 hours on Sabouraud's maltose agar. The active ingredient was identified as a mixture of organic polysulphides in all probability the same as the *Brassica* factor.

1890. Aizawa (H.). **The influence of various antibiotics and antifungal drugs upon adaptive enzyme formation of Candida albicans.**—*Chemotherapy* (*Japan*), 3, pp. 260–266, 1955. [Abs. in *Chem. Abstr.*, 50, 13, col. 9511, 1956.]

At Osaka University, Japan, the influence of various drugs at concentrations of 1 to 10γ per ml. on adaptive enzyme formation in 24-hour-old cultures of *Candida albicans* on Sabouraud's glucose agar at 37° C. was assessed by a manometric technique. Mannose and galactose were adaptively oxidized. Both respiration and adaptive oxidation were inhibited by 8-hydroxyquinoline, merzonin, 2-methyl-3-mercapto-1,4-naphthoquinone, aureothricin, candimycin, eurocidin, and trichomycin, but not by penicillin G, chlorotetracycline [aureomycin], oxytetracycline [terramycin], chloramphenicol, dihydrostreptomycin, propylparaben, dehydroxyacetic acid, or sodium azide. The oxidation of mannose and galactose was inhibited by 8-hydroxyquinoline, merzonin, 2-methyl-3-mercapto-1,4-naphthoquinone, aureothricin, and candimycin, but not by eurocidin or trichomycin.

1891. Perry (H. O.) & Ulrich (J. A.). **Laboratory studies on endomycin, with special reference to its antifungal effect against Candida albicans.**—*J. invest. Derm.*, 24, 6, pp. 623–631, 1955.

In vitro tests carried out at the Mayo Clinic, Rochester, Minnesota, on Sabouraud's dextrose agar showed that endomycin [1, No. 2054] exerts an anti-fungal effect on *Candida albicans*, *C. tropicalis*, *Microsporum canis*, *M. audouini*, *M. fulvum* [*M. gypseum*], *Epidermophyton floccosum*, *Trichophyton mentagrophytes*, *T. rubrum*, *T. schoenleini*, *T. acuminatum* [*T. sabouraudi*],

T. crateriforme [*T. tonsurans*], *Histoplasma capsulatum*, *Blastomyces dermatitidis*, and *Cryptococcus neoformans*, but not on *Sporotrichum schencki*. The compound exerts a stronger influence when the pH of the suspending medium is alkaline (7·5). The resistance of 100 freshly isolated strains of *C. albicans* to endomycin was found to vary over a wide range of concentrations and some were developed with enhanced resistance to the drug. Aqueous solutions of endomycin retain their potency over long periods at room temperature.

1892. Kutscher (A. H.), Seguin (Lucille), Lewis (S.), Piro (J. D.), & Zegarelli (E. V.). **Growth inhibiting properties of phenoxy-ethyl-dimethyl-dodecyl-ammonium bromide (PDDB) (bradosol) against Candida albicans in vitro—preliminary report. Fungicidal properties of phenoxy-ethyl-dimethyl-dodecyl-ammonium bromide (PDDB) against Candida albicans in vitro.**—*Antibiot. & Chemother.*, 4, 10, pp. 1045–1049, 1954; 6, 6, pp. 400–403, 1956.

Highly promising results were obtained in experiments at the Francis Delafield Hospital, New York, on the inhibition of growth of 18 pathogenic strains of *Candida albicans* in brain-heart infusion tube cultures by phenoxy-ethyl-dimethyl-dodecyl-ammonium bromide (bradosol). In the second series of tests it was fungicidal at the concentration used clinically (0·01 per cent.) to all the strains in five to ten minutes.

1893. Schirren (C.) & Rieth (H.). **Folliculitis barbae durch Candida albicans.** [Folliculitis barbae caused by *Candida albicans*.]—*Arch. klin. exp. Derm.* (formerly *Arch. Derm. Wien.*), 202, 6, pp. 577–589, 6 figs., 1956.

Two unusual cases of folliculitis barbae caused by *Candida albicans* in patients aged 64 and 57 are reported from the University Skin Clinic, Hamburg-Eppendorf, Germany. The pathogenicity of the fungus was established by self-experimentation and the inoculation of mice, guinea-pigs, rabbits, and chick embryos.

1894. Robertson (J. A.). **Systemic moniliasis. Report of a case.**—*Calif. Med.*, 84, 2, pp. 115–116, 1956.

At the Los Angeles County General Hospital, systemic moniliasis (*Candida albicans*) developed in a two-year-old boy suffering from *Haemophilus* influenza (type B) who had been treated with multiple antibiotics and sulpha drugs. Recovery followed the surgical drainage of subcutaneous abscesses, discontinuance of the antibiotics, and intensive therapy with a saturated solution of potassium iodide. The case is briefly discussed in the light of six contributions to the relevant literature.

1895. Sturde (H. C.). **Sproßpilze und Nägelveränderungen. I. Systematische Untersuchungen bei Nägelinfektionen durch Hefen und hefeähnlichen Organismen.** [Yeast fungi and nail changes. I. Systematic studies on nail infections by yeasts and yeast-like organisms.]—*Arch. klin. exp. Derm.*, 203, 3, pp. 266–269, 1956.

The following organisms were isolated during the last 2½ years at the Dermatological Clinic of the University of Munich, Germany, from 50 adult patients (38 women and 12 men) with clinical mycosis of the finger- or toe-nails (chiefly the former): *Candida albicans*, *C. parapsilosis* (the predominant species), *C. krusei*, *C. guilliermondii*, *Torulopsis famata*, *T. inconspicua*, *T. candida*, *Trichosporon cutaneum*, *Cryptococcus neoformans* var. *uniguttulatus*, *Saccharomyces cerevisiae*, *Pullularia pullulans*, and *Rhodotorula mucilaginosa*. There were six cases of dual or mixed infection, i.e., two of *C. albicans* and *C. parapsilosis* and one each of *C. parapsilosis* and *C. guilliermondii*,

C. parapsilosis and *T. famata*, *T. candida* and *P. pullulans*, and *R. mucilaginosa* and *P. pullulans*.

1896. Fauconnier (J.). **Sur deux cas d'onychomycose et perionychomycose à Candida albicans, guéris par la mycostatine.** [On two cases of onychomycosis and perionychomycosis due to *Candida albicans* cured by mycostatin.]—*Bull. Soc. franç. Derm. Syph., 1956*, 2, pp. 136–138, 1956.

Details are presented of two cases of onychomycosis, both in women, one 44 and the other 37 years old, caused by *Candida albicans* in France. Both patients were completely cured by mycostatin [2, No. 1618] applied locally and orally.

1897. Kennedy (C. B.), Henington (V. M.), Bordelon (I.), & Snider (K.). **Monilia (yeast-like) infections of the skin and mucous membrane.**—*J. Louisiana med. Soc.*, 106, 11, pp. 419–423, 1954.

The authors discuss the importance of the currently used wide-spectrum antibiotics in relation to the increase in the incidence of infection of the skin and mucous membranes by *Candida albicans*. Whatever are the circumstances giving rise to such invasions, diabetes and other chronic conditions must be sought for as underlying causes. Patients using the newer antibiotics should be instructed in possible side effects so that they may discontinue them when symptoms arise.

1898. Shigematsu (S.) & Eto (K.). **Ulcus rodens in female genital region due to Candida albicans.**—*Kurume med. J.*, 1, 3, pp. 173–184, 8 figs., 1954.

A study was made in the Department of Urology, Kurume University School of Medicine, Kurume-shi, Japan, of a case of ulcus rodens in the external genital region of a 34-year-old woman, caused by *Candida albicans* [2, Nos. 1306, 1307]. Pathogenicity was confirmed by inoculation into rabbits and by exhaustive laboratory experiments. Therapy at first comprised using a permanent catheter and 1 per cent. merzonin [2, No. 1890] absorption ointment. After five days in hospital quartz lamp therapy was applied at 30 cm. for six minutes daily. On the tenth day the catheter was removed and some ointment applied. After three weeks' use the lamp was replaced by zinc ointment and a 2 per cent. merzonin solution compress but was later brought into use again. After 50 days in hospital the condition had disappeared completely.

1899. Schrader-Beielstein (H. W.) & Seeliger (H. P. R.). **Papierelektrophoretische Untersuchungen an Pilzseren.** [Investigations of fungal sera by paper electrophoresis.]—*Z. ImmunForsch.*, 113, pp. 328–332, 1 fig., 1956.

The authors report electrophoretic studies on the serum of rabbits before and after immunization with a number of fungal antigens. In most cases, as, for example, *Candida tropicalis*, *Pullularia pullulans*, *Blastomyces* [*Paracoccidioides*] *brasiliensis*, *Sporotrichum schencki*, and *Kloeckera apiculata*, the rise in antibody titre, demonstrable by serological methods, was reflected by a rise in the β and γ globulins, particularly the latter. Where antibody response was poor, as in *C. krusei*, there was no substantial change in γ globulins.

1900. Meloni (F.). **Mykotische Harntraktinfektion mit transitorischer Nephrolithiasis während langdauernder Immobilisierung.** [Mycotic urinary tract infection with transitory nephrolithiasis during prolonged immobilization.]—*Schweiz. med. Wschr.*, 85, 27, pp. 651–655, 5 figs., 1 diag., 1955.

This is a comprehensive report and discussion of a secondary infection (not preceded by broad-spectrum antibiotic treatment) of the urinary tract (an

unusual site) induced by *Candida albicans* in a 44-year-old female patient at the Zürich National Sanatorium, Davos-Platz, during immobilization in plaster for tubercular spondylitis and osteochondrosis of the thoracic and lumbar vertebrae. A cure of the mycosis was effected by the combined administration of terramycin and paraben [see next entry].

1901. Maier (C.), Wegmann (T.), & Lichtensteiger (A.). **Der Nachweis von Candida albicans im Blutausstrich bei Pilzpyämie.** [The demonstration of *Candida albicans* in blood smears in fungal pyæmia.]—*Schweiz. med. Wschr.*, 86, 13, pp. 331–333, 1 col. fig., 1956.

This is a joint report from the Regional Hospital, Männedorf, and the Medical University Polyclinic, Zürich, Switzerland, on four cases of moniliasis (*Candida albicans*) associated with antibiotic therapy for other diseases, in which the fungus was demonstrated by the Giemsa stain in blood smears. Two of the patients recovered following specific treatment with paraben [2, Nos. 1507, 1875, 1876, 1900] *per os* and topical applications of gentian violet, but the other two succumbed to the superinfection.

1902. Bontke (E.). **Pilzgranulom des Hodens.** [Fungal granuloma of the testicle.] *Z. Urol.*, 48, 12, pp. 787–791, 4 figs., 1955.

This is a report from the Pathological Institute of the University of Bonn, Germany, on a granuloma of the left testicle, caused by *Candida parakrusei*, in a 55-year-old patient at the University Surgical Clinic, where an operation was performed for its removal. Very few such cases have been recorded and the origin of the present one is obscure.

1903. Bound (J. P.). **Thrush napkin rashes.**—*Brit. med. J.*, *1956*, pp. 782–784, 2 figs., 1956.

At the University College Hospital, London, *Candida albicans* was isolated from 39 out of 47 cases diagnosed as thrush napkin rash. Three cases yielded other fungi. Oral thrush was present in twelve cases without napkin rash, and *C. albicans* was obtained from the perianal area of five of these. The clinical features and differential diagnosis of thrush napkin rash are described. The cases were treated with 0·1 per cent. merthiolate solution and titanium dioxide paste. Seven cases relapsed but responded to further treatment. It is suggested that the presence of maternal thrush vaginitis may be an aetiological factor.

1904. Sansonetti de Real (A.). **Moniliasis en Aves (Gallus dom.) de Venezuela.** [Moniliasis in Birds (*Gallus dom.*) of Venezuela.]—*Rev. Med. vet. Carácas*, 13, 1/4, pp. 181–186, 1954.

The author describes a small outbreak of moniliasis, on a private farm in Venezuela, among week-old chicks imported from the United States in February, 1954, and weakened in their defences by the process of acclimatization. The clinical picture included general debility and paresis of the legs and wings, without diarrhoea or mortality. *Candida albicans* was present in whitish, ulcerous lesions in the rhinopharyngeal region, crop, gizzard, and intestine, and produced inflammation of the bronchi and lungs.

1905. Quak (Freda) & Rodrigues Pereira (A. S.). **Antifungal properties of 1.2.3.4.-tetrahydro-9-fluorenone.**—*Leeuwenhoek ned. Tijdschr.*, 22, 2, pp. 177–189, 1 graph, 1956.

In vitro studies at the Willie Commelin Scholten Phytopathological Laboratory, Baarn, demonstrated the marked fungicidal activity of 1.2.3.4-tetrahydro-9-fluorenone against *Candida albicans*, *Microsporum gypseum*, *Trichophyton rubrum*, *M. audouini*, and *T. mcgnini*. It was diminished approximately fourfold by the addition of serum to the medium.

1906. Smith (G. M.) & Armen (R. M.). **Pulmonary moniliasis treated by brilliant green aerosol : report of a case.**—*Ann. intern. Med.*, 43, 6, pp. 1302–1309, 3 figs., 1955.

A case of pulmonary moniliasis (*Candida albicans*) in a 30-year-old man is described from the Veterans' Administration Hospital, Wilkes-Barre, Pennsylvania. Symptoms and X-rays indicated lower right lobe pneumonia, but the patient failed to respond to antibiotics. *C. albicans* was subsequently isolated from lung biopsy tissue and pleural fluid as well as from successive samples of sputum, and the diagnosis of pulmonary moniliasis is thus considered well substantiated. Treatment was by brilliant green aerosol inhalations in interrupted courses over an eight-month period at a dosage rate of 0·25 mg./kg. body weight per day. No toxic symptoms were noted, and the patient was able to resume a normal life and appeared to be in good health at the end of treatment.

1907. Stenderup (A.), Bichel (J.), & Kissmeyer-Nielsen (F.). **Pentamidin ved moniliasis.** [Pentamidine in moniliasis.]—*Nord. Med.*, 55, 17, pp. 589–592, 1 graph, 1956. [English summary.]

Two cases of the successful treatment of pulmonary and oesophageal moniliasis (*Candida albicans*) in males aged 57 and 25 years by the administration of pentamidine at a dosage of 200 mg. daily for 12 days are reported from the Radium Station, Aarhus, Denmark. In pure culture on meat bouillon agar at pH 7, the growth of the strain from the former case was completely inhibited by pentamidine at a concentration of $\frac{1}{128}$ mg. per ml., whereas the isolate from the latter required one of $\frac{1}{32}$ to produce comparable results.

1908. Koulumies (R.) & Patiala (R.). **Occurrence of yeast-like fungi in salivary flora and the effect of antibiotic therapy.**—*Ann. Med. exp. biol. Fenn.*, 33, 1–2, pp. 41–51, 1955.

Using three media, of which oil Sabouraud medium proved to be the best, the authors examined the fungi present in the saliva of 292 unselected patients at the second medical clinic, University of Helsinki, Finland. Of these 123 were examined again three weeks later following treatment with penicillin (49 patients), broad spectrum antibiotics (23), or no antibiotics (51). Penicillin appeared to have no effect on the occurrence of fungi in the saliva, but with broad spectrum antibiotics there were signs of an increase in yeast-like fungi, though the number of patients was too small to permit any conclusion to be drawn. In 66 patients there was no change.

The incidence of yeast-like fungi [unspecified] before antibiotic treatment was greatly variable, and the patients could be classified in five groups, the lowest containing patients with no yeast-like fungi in the saliva while the highest contained those producing more than ten foci in all types of culture with three media. The incidence of fungi was higher in old persons and in those who were physically weak or had bad teeth, than in young persons and those in good physical condition.

1909. Zapater (R. C.) & Malfatti (M.). **Aspect morphologique de quelques champignons pathogènes au microscope electronique.** [Morphological aspect of some pathogenic fungi under the electron microscope.]—*Bull. Soc. Hist. nat. Toulouse*, 90, 3–4, pp. 287–292, 11 figs., 1955.

Viewed under the electron microscope at a magnification of 3,500 to 10,000, the oval blastospores of *Candida albicans* from a potato water culture at 37° C. present a well-defined membrane with a fairly transparent ectoplasm, while the central portion of the cytoplasm appears dense, rounded, and full of

substance. The pseudo and true hyphae of *C. tropicalis* also present condensations of elongated form and differing volume, probably associated with the processes of development and growth [2, No. 1706].

At 37° *Histoplasma capsulatum* and *H. duboisii*, cultured on a medium containing blood, both produce buds; at 25° the latter develops a filamentous mycelium.

The cells of *Paracoccidioides brasiliensis* are characterized both in the host tissue and in culture by multiple budding. The interior of each bud produced by a mother cell contains cytoplasmic condensations. Maintained at a temperature of 25°, cultures of the yeast phase give rise exclusively to hyphae.

Sporotrichum schencki is remarkably polymorphous in the host tissues, which contain fusiform elements resembling 'cigars', or they may be spherical, ovoid, or asteroid. This yeast phase develops in cultures held at 37°, either in a medium enriched with blood or in a complex liquid medium in an atmosphere of carbon dioxide. The cells produced *in vitro* are similar to those developing *in vivo*, and equally polymorphous, each giving rise to four buds, 7 by 2 μ.

Nocardia spp., e.g., *N. madurae*, appear as hyphae branching dichotomously or laterally with a cytoplasm of varying density. *N. asteroides* contains a few spherical bodies resembling spores, the exact significance of which, however, can only be elucidated by further cytochemical studies.

1910. Abbott (P.). **Mycetoma in the Sudan.**—*Trans. R. Soc. trop. Med. Hyg.*, 50, 1, pp. 11–24, 4 pl., 1956.

The importance of mycetoma in the Sudan, particularly in the hot, arid climate of the middle belt, is emphasized by an assessment of the number of hospital admissions for this cause per thousand of the total. The figure for Khartoum, for example, was 5·1. Three fungi were responsible for all but one of the 1,213 cases mentioned, viz., *Madurella mycetomi* [cf. next entry], *Streptomyces* [*Nocardia*] *somaliensis*, and *S.* [*N.*] *pelletieri* [2, No. 679]. The lesion was on the foot in 168 cases. The clinical findings and pathology are discussed.

An amended definition of *M. mycetomi* is given, establishing its identity with *Glenospora khartoumensis* [1, No. 777]. Treatment of infection due to *S. somaliensis* with oxytetracycline [terramycin] and carbomycin for long periods resulted in at least temporary cure.

1911. Mackinnon (J. E.). **A contribution to the study of the causal organisms of maduromycosis**—*Trans. R. Soc. trop. Med. Hyg.*, 48, 6, pp. 470–480, 18 figs., 1954.

In this paper from the Institute of Hygiene, Faculty of Medicine, Montevideo, Uruguay, 83 strains of moulds from cases of maduromycosis in various parts of the world were studied. Actinomycetes were excluded. Of the strains present 75 were classified as follows: *Madurella mycetomi* [cf. preceding entry] 51 strains, *M. grisea* 10 strains, *Phialophora jeanselmei* three strains, *Allescheria boydii* eight strains, and *Cephalosporium falciforme* three strains. *M. mycetomi* was the commonest strain from the Sudan. *M. grisea* was found only in the Western Hemisphere. Some of the remaining eight strains were probably contaminants.

The classification of these fungi is discussed in the light of the author's experience. With regard to *M. mycetomi*, he would include in this species *M. ikedai*, *M. americana*, *M. ramiroi*, *Glenospora khartoumensis*, and some previously unnamed or controversial strains. The position of *M. grisea* he would still retain in the genus *Madurella*. The remaining species are described briefly.

1912. Reifferscheid (M.) & Seeliger (H.). **Monosporiose und Maduromykose. Die sogenannte therapieresistente Actinomykose.** [Monosporiosis and maduromycosis. The so-called therapy-resistant actinomycosis.]—*Dtsch. med. Wschr.*, 80, 50, pp. 1841–1844, 1867, 9 figs., 1955. [English and Spanish summaries.]

This is a detailed report of the clinical and mycological aspects of a case of infection by *Monosporium apiospermum* [*Allescheria boydii*] in a 57-year-old female patient at the University Clinic, Bonn, Germany, presumably contracted many years previously through injury to the thigh from a splinter in a privet hedge. A virtually complete cure was effected by a protracted course of intramuscular injections of diacetyl 2'2-dioxy-5'5-dichlorodiphenyl sulphide. This is believed to be the first record of monosporiosis in Germany and possibly in Central Europe.

1913. Seeliger (H.). **A serologic study of hyphomycetes causing mycetoma in Man.**—*J. invest. Derm.*, 26, 1, pp. 81–93, 2 figs., 1956.

From the Institute of Hygiene, University of Bonn, Germany, the author reports the first recognized case in Central Europe of maduromycosis due to *Monosporium apiospermum* [see preceding entry], the conidial state of *Allescheria boydii*. It occurred in a 57-year-old woman and had persisted for 26 years. Serological studies showed that hyphomycetes known to be causative agents of maduromycosis stimulate the production of antibodies in hyperimmunized rabbits. Strains of *M. apiospermum* collected from Africa, Europe, and North and South America belonged to the same serological group, as did also *Indiella americana* and *Acremoniella betyi*. A second serogroup consisted of strains of *Madurella grisea*; *M. americana* and *Glenospora clapieri* [1, No. 1727] were unrelated to any other culture tested. The serological specificity of these groups was confirmed with antisera from 30 other pathogenic and non-pathogenic fungus species. In the German case of maduromycosis the presence of specific agglutinins, precipitins, and complement-fixing bodies was shown, and skin sensitivity was also demonstrated. No overlapping occurred with antigens from other agents of maduromycosis. No such antibodies were observed in healthy human controls, and it is therefore considered that the tests may be of diagnostic value after further study. Cross-reactions were demonstrated in the complement fixation test with antigens from *Trichophyton rubrum*, *T. mentagrophytes*, and *Acremoniella rugulosa*, but they were not accompanied by skin sensitivity against extracts of these fungi. This test must therefore be interpreted with caution in cases of maduromycosis.

1914. Hanlon (T. J.), Gephardt (M. C.), & Hopps (H. C.). **Mycetoma in the United States : review with report of a case from new area.**—*J. Okla. med. Ass.*, 48, 10, pp. 299–303, 1955.

The case of mycetoma herein reported from the Department of Pathology, University of Oklahoma School of Medicine, and the Veterans' Administration Hospital, Muskogee, involved the left ankle and foot of a 66-year-old negro. The fungus isolated from the inner malleolar area of the ankle was characterized by branching hyphae, 5 to 6 μ in diameter, and circular bodies, 8 to 10 μ, with a central dark blue mass, presumably spores. The organism is tentatively referred to *Monosporium apiospermum* [*Allescheria boydii*]. This is the first record of the disease in the State or in South Carolina, Georgia, and Missouri, where the patient had resided before 1916.

1915. Neuhauser (Irene). **Black grain maduromycosis caused by Madurella grisea. Report of the first North American case and its response to therapy with diaminodiphenylsulfone.**—*Arch. Derm. Syph. Chicago*, 72, 6, pp. 550–555, 4 figs., 1955.

A case of black grain maduromycosis of the foot caused by *Madurella grisea* in a negress born in the United States is described. This is the first case caused by the disease to be reported from North America. The causative organism was identified by cultural and biochemical procedures. Promising therapeutic results were obtained with 4,4-diaminodiphenyl sulfone.

1916. Wood (J. L.). **Mucor pusillus Lindt from Maryland and some notes on its nutrition.**—*Proc. Pa Acad. Sci.*, 29, pp. 115–120, 4 figs., 1955.

In studies at the Fungus Laboratory, the Johns Hopkins Hospital, Baltimore 5, Maryland, an isolate of *Mucor pusillus* received from a mushroom house in Maryland was found to be pathogenic to mice. It grew more readily at 37° C. than at room temperature and appeared to have no vitamin requirements. With glucose as a carbon source, peptone, uric acid, urea, asparagine, ammonium sulphate, and potassium nitrate were suitable as sole sources of nitrogen. Growth occurred on both l-xylose and d-arabinose, but there was a much longer initial lag than when the natural sugars were supplied.

1917. Symeonidis (A.) & Emmons (C. W.). **Granulomatous growth induced in Mice by Absidia corymbifera.**—*Arch. Path.* (*Lab. Med.*), 60, pp. 251–258, 8 figs., 1955.

A tumour-like subcutaneous granuloma was induced in mice injected subcutaneously in the dorsoscapular region with suspensions of 50 to 100 spores of *Absidia corymbifera* [2, No. 918]. The growth resembled a true neoplasm, proliferating slowly and constantly into the surrounding tissues and the peritoneal cavity. It was transmitted to other mice by subcutaneous inoculation with tissue fragments. Except for the regional lymph nodes the lesion did not extend to other organs. It was not produced by direct intraperitoneal injection.

1918. Harris (J. S.). **Mucormycosis ; report of a case.**—*Pediatrics*, 16, 6, pp. 857–867, 6 figs., 1955.

A case of mucormycosis of the central nervous system caused by *Rhizopus arrhizus* in a 14-year-old diabetic negress is fully reported from the Duke Hospital, Durham, North Carolina, diagnosis being established by biopsy and culture (by N. F. Conant). Recovery followed rigid control of the diabetes, desensitization against the fungus, and the administration of potassium iodide. The literature of the disease (24 titles) is reviewed, with special reference to the rare cases involving the nervous system [cf. 1, Nos. 341, 967, 1957; 2, Nos. 1075, 1357].

1919. Coutelen (F.), Biguet (J.), Cochet (G.), Mullet (S.), & Doby-Dubois (M.). **Étude d'un champignon nouveau isolé d'une tumeur mycosique pulmonaire.** [A study of a new fungus isolated from a mycotic pulmonary tumour.] —*Ann. Parasit. hum. comp.*, 30, 4, pp. 395–419, 8 pl., 1955.

A full account is given of a fungus, provisionally assigned to *Scopulariopsis* under the name *S. insolita*, isolated from a case of pulmonary mycosis in a female patient aged 40 years, resident at Nevers, France.

1920. Lubinsky (G.). **On some parasites of parasitic protozoa. I. Sphaerita hoari sp.n. A chytrid parasitizing Eremoplastron bovis.**—*Canad. J. Microbiol.*, 1, 6, pp. 440–450, figs., 1955.

In a study of the ruminal ciliates in Jamnapari goats, Indian cattle (*Bos indicus*) and water buffaloes (*Bubalus bubalus*) material was fixed in serum by formalin vapour and stained with a modification of Mayer's acid haemalum. *Sphaerita*-like organisms were present in ten ciliate species, of which usually

only a small percentage were affected. In *Eremoplastron bovis* from one goat, however, 19 per cent. contained sporangia of a fungus which fitted the description of *Sphaerita* well, except that the thallus was naked. The author assigned it to that genus, however, pending further studies of the vegetative structure of the type species. The life-history of the fungus was worked out from this material, and the name *S. hoari* n.sp. proposed.

1921. Locke (R. K.). **Onychomycosis.**—*J. nat. Ass. Chir.*, 45, 1, pp. 15–28, 10 figs., 1955.

A series of 36 cases of clinical onychomycosis caused by *Monilia*, *Trichophyton* spp., and *Penicillium*, separately or together, was treated by mechanical debridement, salicyclic acid plaster, a desenex salicyclic acid brush scrub, and continuous elimination of infected nail tissue, together with measures to prevent reinfection. Twenty-seven cases developed new, healthy nail growth which remained clear of infection at subsequent examination. The importance of trauma arising from shoe pressure, direct trauma, and self-treatment of ingrown and inverted nails in causing onychomycosis is demonstrated. The hallux nails were found to be the most frequently involved, a phenomenon not previously stressed in the literature.

1922. Vanbreuseghem (R.) & Gatti (F.). **Enquête sur l'incidence des teignes du cuir chevelu chez les Indigènes du Congo belge.** [Inquiry on the incidence of tinea tonsurans among Natives of the Belgian Congo.]—*Ann. Soc. belge Méd. trop.*, 35, 6, pp. 805–815, 1955. [Flemish summary.]

Of 77 cases of suspected tinea tonsurans out of a total of 3,000 native children examined in the Befale region of the Belgian Congo [see next entry], 74 were confirmed by laboratory studies. The species implicated were *Microsporum* [*Trichophyton*] *ferrugineum* in 81 per cent., *M. langeroni* [1, No. 1996] in 14·5, and *Sabouraudites catanei* n.sp. (diagnosis not yet published) in 4·5. Boys were more susceptible than girls in the ratios of 1·4 : 1 from two to five years and 3·8 : 1 from five to 12.

1923. Gatti (F.) & Vanbreuseghem (R.). **Traitement des teignes du cuir chevelu par l'astérol chez les Indigènes du Congo belge.** [Treatment of tinea tonsurans by asterol among Natives of the Belgian Congo.]—*Ann. Soc. belge Méd. trop.*, 35, 6, pp. 711–717, 1956. [Flemish summary.]

Of 29 native children in the Befale region of the Belgian Congo who were treated with topical applications of asterol ointment or tincture for tinea tonsurans caused by *Microsporum* [*Trichophyton*] *ferrugineum* or *M. langeroni* [see preceding entry], 14 (48 per cent.) were cured and six (21) improved. The ages of the group ranged from two to eight years and six of the patients were girls.

1924. Richter (R.), Tat (L.), & Erbakan (N.). **Die Epidermophytien in Zentralanatolien.** [The epidermophytoses in central Anatolia.]—*Z. Haut u. Geschlechtskr.*, 20, 7, pp. 198–208, 1956.

From a survey of the prevalence of epidermophytoses at the Dermatological Clinic, University of Ankara, Turkey, covering the period from 1946 to 1955, it appears that this formerly very rare group of mycoses is beginning to assume epidemiological proportions. *Epidermophyton inguinale* [*E. floccosum*] was found to be the most prevalent agent, especially of epidermophytia plantaris and palmaris, being represented in 87 (75 per cent.) of the 116 positive cultures obtained from 374 cases in 1954–5. *E. interdigitale* [*Trichophyton mentagrophytes*] and *E.* [*T.*] *rubrum* were of minor importance, occurring in 10 (8·7) and 16 (13·7) cases, respectively. *T. violaceum* was identified in two cases

of onychomycosis, while *M. canis* was isolated from one patient with the squamous form of epidermophytosis plantaris et palmaris.

1925. Lopez (R. A.). **Dermatomicosis en la provincia de Mendoza.** [Dermatomycosis in Mendoza province.]—*Rev. Sanid. milit., B. Aires.*, 53, 1, pp. 117–121, 1954.

The author reviews the history, symptoms, and current knowledge of the dermatomycoses present in the Mendoza province of Argentina.

1926. Kleine-Natrop (H.-E.). **Beiträge zur Epidemiologie und Klinik der Mikrosporie. I. Verbreitung der Mikrosporie in Deutschland. Weiterer Verlauf der schleswigholsteinischen Epidemie. Klinisches Bild und therapeutische Entwicklungslinien.** [Contributions to the epidemiology and clinical manifestations of microsporosis. I. Spread of microsporosis in Germany. Further course of the Schleswig-Holstein epidemic. Clinical aspects and therapeutic trends.] —*Derm. Wschr.*, 132, 45, pp. 1190–1197, 2 figs., 2 maps, 1955.

At the time of the third International Congress of Dermatologists, held in London in 1896, microsporosis was already prevalent in England, France, Belgium, and Spain, and had been endemic for years in London and Paris. At the turn of the century it spread into Denmark, Italy, Austria, Switzerland, and Germany. The first Schleswig-Holstein epidemic, involving 30 children, occurred in 1933, though six cases had already been observed in 1920–1. The second started during the winter of 1945–6; by the summer of 1951 the number of cases observed was 224 and at the beginning of 1953 it had risen to 400, *Microsporum audouini* being the predominant species. The various modes of therapy in current use, comprising topical applications of antimycotics, the use of pyrogallic ointments and other compounds to induce inflammatory reactions with a view to quicker healing, and mechanical, X-ray, and thallium epilation are critically discussed; none is regarded as entirely satisfactory. A promising fresh approach to the problem is the introduction of new soft-ray apparatus (dermopan, dermolux), which appear from preliminary observations to combine efficiency with safety.

1927. Alvarez de Lara y García (R.). **Contribución al conocimiento micológico de las dermatomicosis en España y de su epidemiología.** [Contribution to the mycological knowledge of the dermatomycoses in Spain and their epidemiology].—*Rev. Sanid. Hig. publ., Madr.*, 29, 7/8, pp. 309–343, 6 pl., 1955.

Of the 59 cases of dermatomycosis from two hospitals in Madrid comprised in this fully documented report [cf. 2, No. 1368], 42 (71·2 per cent.) were caused by *Microsporum* spp. (40 by *M. canis* and one each by *M. audouini* and *M. gypseum*), 15 (25·4) by *Trichophyton* spp. (11 by *T. violaceum*, three by *T. mentagrophytes*, and one by *T. acuminatum* [*T. sabouraudi*]), and two (3·4) by *T. schoenleini*. The patients' ages ranged from one to 15 years and upwards. *M. canis* was responsible for the infection of 25 boys and 15 girls, while only one of the 11 harbouring *T. violaceum* was a female.

In seven cases of infection by *M. canis* a cat was known to be the source, in another five contagion was interhuman but with animals as the original foci, two were hospital contacts, and in the remainder the primary cause could not be determined. The complaint was most prevalent in the winter and autumn, especially during January and September. Five of the cases of infection by *T. violaceum* were in inmates of a school and an orphanage. One of the favus cases was of animal origin and the second was a contact.

1928. Ristic (M.) & Sanders (D. A.). **Canine microsporosis.**—*Vet. Med.*, 50, 5, pp. 225–228, 7 figs., 1955.

Three cases of *Microsporum canis* infection in dogs are described from the Department of Veterinary Science, University of Florida. In one case, of partial alopecia with orange-brown crust formation progressing into erythema and tissue oedema of the right front foot of a male boxer, cure was achieved by swabbing the affected area thoroughly with acetic acid, drying off with the heat from an electric lamp bulb, and then rubbing in iodine and oil, followed by a further ten minutes' heat, which was thought to facilitate the penetration of the iodine.

Infection, with alopecia, scaling, erythema, and tissue oedema, was produced within eight days in two out of three two-week-old rabbits, one out of three guinea-pigs, and one out of three hamsters by applying infected hair roots to the scarified skin, and holding them in position for 24 hours with a cheesecloth covering.

1929. Rebell (G.), Timmons (H. F.), Lamb (J. H.), Hicks (P. K.), Groves (F.), & Coalson (R. E.). **Experimental Microsporum canis infections in Kittens.** —*Amer. J. vet. Res.*, 17, 62, pp. 74–78, 4 graphs, 1956.

The course of experimental and accidental laboratory infections in 76 four- to six-week-old kittens with *Microsporum canis* is fully described from the University of Oklahoma School of Medicine. The lesions began to develop about four days after inoculation, expanded rapidly for 28 days or so, and then entered a phase of regression which persisted for an average period of six months before complete disappearance. In the atypical cases characterized by absence of hair invasion, apparently due to the use of an attenuated strain of the fungus, resolution of the infection occurred about a month after inoculation. Inflammatory responses were negligible and no skin test reactions were elicited by trichophytin and antigen preparations from the strains used, the pathogenicity of which was demonstrated by experiments on guinea-pigs and on man. In the 17 kittens that contracted accidental infection the nose, ears, and feet were the primary sites of lesions. The accidental infection of 10 hound puppies with *M. canis* resulted in indurated and crusted lesions, accompanied in two cases by kerion.

In view of the chronicity of infection and the minimal inflammatory response induced by *M. canis* in cats, it is suggested that they provide the major reservoir and are probably the 'natural' hosts of the fungus.

1930. Pereiro Miguens (M.). **Un caso de microsporía de la barba.** [A case of microsporiosis of the beard.]—Reprinted from *Act. dermo-sifilogr., Madr., 1955*, No. 1, 3 pp., 1955.

A case of microsporiosis of the beard in a 28-year-old male from Carballo, La Coruña, Spain, caused by *Microsporum canis* [1, No. 2499] is described. It was cured by manual removal of the affected hairs, disinfection with 1 per cent. salicylic iodide, and the application of undecylenic ointment.

1931. Magnin (P. H.) & Vivot (N. A.). **La luz de Wood en las tiñas microspóricas.** [Wood's light in tinea caused by *Microsporum*.]—*Sem. méd., B. Aires*, 106, 21, pp. 732–734, 1955.

The authors' experiments confirmed the importance of Wood's light in the diagnosis, prophylaxis, and treatment of infection with *Microsporum audouini*, *M. lanosum* [*M. canis*], and *M. fulvum* [*M. gypseum*]. It revealed variations in the behaviour of the fluorescent substance *in vitro* (*a*) in aqueous solution before treatment with sulphuric ether, (*b*) at different pH values, and (*c*) with potassium iodide.